

A
SURVEY

Of the Ancient
Husbandry and Gardening,

Collected from

CATO, VARRO, COLUMELLA,
VIRGIL, and others the most eminent
Writers among the

Greeks and Romans:

Wherein many of the most difficult Passages in those Authors are explain'd, and the whole render'd familiar to our Climate; with Variety of new Experiments.

Adorn'd with CUTS.

With a PREFACE, shewing the Use of Husbandry, and the Necessity of erecting Publick Gardens.

By R. BRADLEY, Professor of Botany in the University of Cambridge, and F. R. S.

L O N D O N:

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To the RIGHT HONOURABLE, the
LORD VISCOUNT
TOWNSHEND,
One of His Majesty's Principal Secretaries of State, &c.

My LORD,



THE following Treatise contains the Sum of the *Greek* and *Roman* Husbandry; upon which, as far as it has been intelligible, the Improvement of Land in *England* is chiefly founded. This Study was held in so much esteem among the Ancients, that the most Noble Personages did not think it unworthy their Regard; for they did not only encourage it among the Common People, as a Branch of useful Knowledge which might advantage their Country, but were so sensible of the agreeable Recreations it carry'd along with it,

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that they disdain'd not to take a Part in it themselves.

If, My LORD, I have been Fortunate enough to explain the Meaning of some of the Ancients upon this Head, where they have been esteem'd a little Difficult, or have added any Thing to their Works which may prove useful to my Country, I am perswaded there can be no surer Way of recommending it to the World, than by putting it under the Patronage of your LORDSHIP, who so happily possesses the Love and Esteem of all Mankind.

And that it may claim some Right to your LORDSHIP's Favour, I can only say, it has been my endeavour to render it publickly Beneficial. I am,

My LORD,

with the greatest Respect,

Your LORDSHIP's

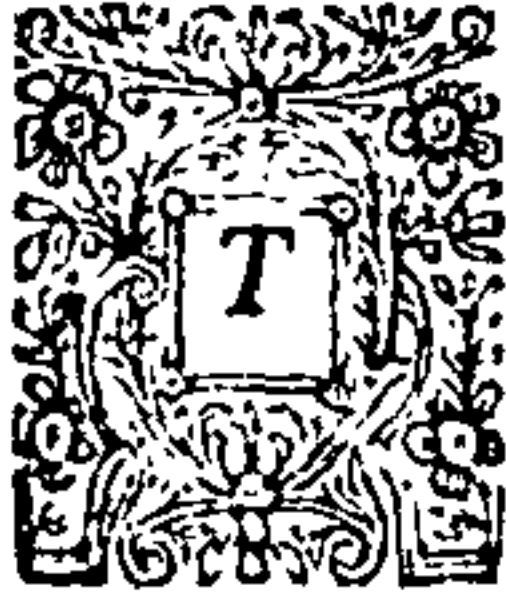
most Devoted Humble Servant,

R. Bradley.

THE



T H E
P R E F A C E.

 *THE following Work, as it contains the Sum of what the ancient Writers of Husbandry have written concerning the Improvement of Land, so it likewise brings to our View the Esteem and Respect with which the ancient Greeks and Romans were honour'd, who had any way signaliz'd themselves in that Study: We find that Husbandry was accounted a Study so extremely beneficial to the Commonwealth, that Persons of the highest Rank and Figure did not only promote the Practice and Improvement of it among the Common People, but took a Pride to distinguish themselves by such new Inventions and Contrivances as might add any thing to an Art of so general Advantage. I remember to have read somewhere, in an Author of good Reasoning, that a Country well managed in point of Husbandry, might bring as much*
2 3 *Profit*

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Profit to the People as their foreign Trade, although the latter was upon the best footing; and especially I think Britain might yet be brought to a much greater Perfection in Agriculture than it is at present, if our Farmers had Opportunities and Judgment to try Experiments, or had some fix'd Place, where they might see Examples of all Kinds of Husbandry, as a School, for their Information; which I hope to compass, as soon as a Physick Garden is compleated at Cambridge; where, besides collecting such Plants as are used in Physick, and choice Vegetables from foreign Countries, a little Room may be spared for Experiments tending to the Improvement of Land, which may be a Means of encreasing the Estate of every Man in England; for in such an Undertaking every Kind of Soil must be used, and every Situation imitated.

But this new Foundation of a Physick-Garden at Cambridge is yet an Affair of much greater Concern, as it will conduce to the general Health of Mankind, by instructing those who are any ways related to the Practice of Physick, in those Plants and Druggs which they are to use; a Thing, which at present is so little understood, that too frequently we find the wrong Herbs are administered, by such who make Pharmacy their Business, to the Destruction of the Patient, and to the Prejudice of the Physicians Character who prescribes; so that 'till this is redress'd, which can only be by the Establishment of Physick Gardens, the most able
Physi-

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Physicians may prescribe in vain, and the Lives of Thousands may be lost.

To confirm what I say, I need only state the Case as it now is, whereby we may judge of the Necessity of our Apothecaries being good Botanists; I mean, to understand Botany so well as to judge rightly of the Official Plants, for so far the Life of every Patient is concerned; for if we consider, that the Herbs, which are used in the Shops, are collected and gather'd chiefly by poor People, who, though they know a few Herbs, are far from being Judges of all the Plants they bring to Market; and who, to make up their Burden, crowd in any Thing they can get, and impose Names upon them to those who keep the Herb Shops, or who engross them for Retailing, and know as little of them as the Gatherers themselves; and the Imposition is carry'd on so far, that unless they happen to fall into skilful Hands, they are improperly made into Medicines, and perhaps are so directly contrary to the End which they were design'd for, that they prove fatal, and the sick Person suffers. But it is some Satisfaction to find, that the Gentlemen, who have the Care of the Physick Garden at Chelsea, have begun to instruct some of the Youth about London in this useful Knowledge; and that we are not without some great Men who do Honour to Pharmacy, in the Accuracy of their Judgment, and their Exactitude in making up their Medicines, of which Number is Mr. Lloyd, Apothecary,

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thecary, in Aldersgate-street, a Gentleman truly curious in his Choice of Druggs, and other Branches of the Materia Medica ; which contributes so much to the Welfare of his Patients, that his Example is well worthy to be imitated.

As the Case is, the Design of erecting a Physick Garden at Cambridge, must prove of extraordinary Benefit to the Publick ; as the young Gentlemen, who study Physick at that University, will then have Opportunity of knowing the Plants, and even the Druggs they are to use, which hitherto has not fallen directly in the Way of such Students : 'Tis upon this Account, that several Noblemen and Gentlemen have promis'd to contribute towards a Garden at Cambridge, and merit the Honour of being enroll'd in the List of its Founders ; which, in all likelihood, will amount to a considerable Number, considering how much the Welfare of Mankind will depend upon it. Nor is it only the Advantages I have already mentioned which may accrue to a Nation from a Garden of this Sort ; as will appear, if we take a View of the Benefits which arise to the Hollanders, by means of their Physick Garden at Amsterdam : where, besides the Advantage the Practitioners in Physick reap from the publick Botanical Lectures ; which are read there by two Professors, in their Turns ; that Garden is continually receiving Varieties of useful Plants from several Parts of the World ; which, as the Governors see Occasion, are trans-

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transmitted to some of their own Plantations, the least distant from them, and thereby advantage their Trade: One Instance of this is in the Coffee-Tree, which at first they cultivated at Batavia, 'till they imported many Tun Weight from thence of their own Growth, and brought Trees of it to Amsterdam; where, after a little Time, they raised several Hundreds, and sent them to Surinam and Curasau, in the West Indies, from whence, I am told, they receive a good Freight of Coffee every Year; which is but a short Voyage, compared with that they used to take on account of that Drugg; and it is not to be doubted, but that in a few Years, they may gather Coffee enough in those Plantations to supply the greatest Part of Europe. When I consider this, and at the same Time reflect upon the State of our American Plantations, and our extensive Trade, I can see no Reason but that we may render them more advantageous than they are at present, by sending to them many Plants of Use, which will grow freely there, and may be collected and prepared for them, in such a Garden as I speak of.

I think these Considerations may be sufficient to shew the Advantages which may arise to the Publick from a compleat Physick Garden; and especially, the extraordinary Necessity of such a School of Botany in an University; which I doubt not but every Man of Sense will agree to, and promote according to his Ability, that so useful a Branch of Learning may be propagated without delay; for which
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Purpose it is to be wish'd, that those Gentlemen, who are inclin'd to become Founders of it or Contributors to it, would communicate their Intentions to the Reverend Dr. Savage, Vice-Chancellor of the University of Cambridge, that their Benefactions may be laid out upon this new Foundation, as the University may see convenient; that is, in the Purchase of a Piece of Ground, and the disposing of it in such a Manner as may render it Useful and Honourable to the University, and a lasting Monument of the Generous and Publick Spirits of its Founders.

*As to the Particulars of such a Garden; I have already touch'd upon the principal Uses of it, in the Beginning of this Preface; and it remains only to observe, that there can be little Difference in the Purchase of a Piece of Ground for it, whether it is already enclosed, or is entirely open; for if an Enclosure already built will add to the Price of Ground, it will amount to nearly the same Thing to purchase an open Piece of Ground and enclose it afterwards; and then the Enclosure may be made regular and lasting, while an old enclosed Ground will be continually wanting Repairs; so that in the End one will be as expensive as the other. As for the other Expences, they will chiefly be in erecting Green Houses, and other Conveniencies, for raising and keeping of Plants, and for the laying out of the proper Walks. But as for the Plants which are necessary for it, I have already collected a good Number, to which,
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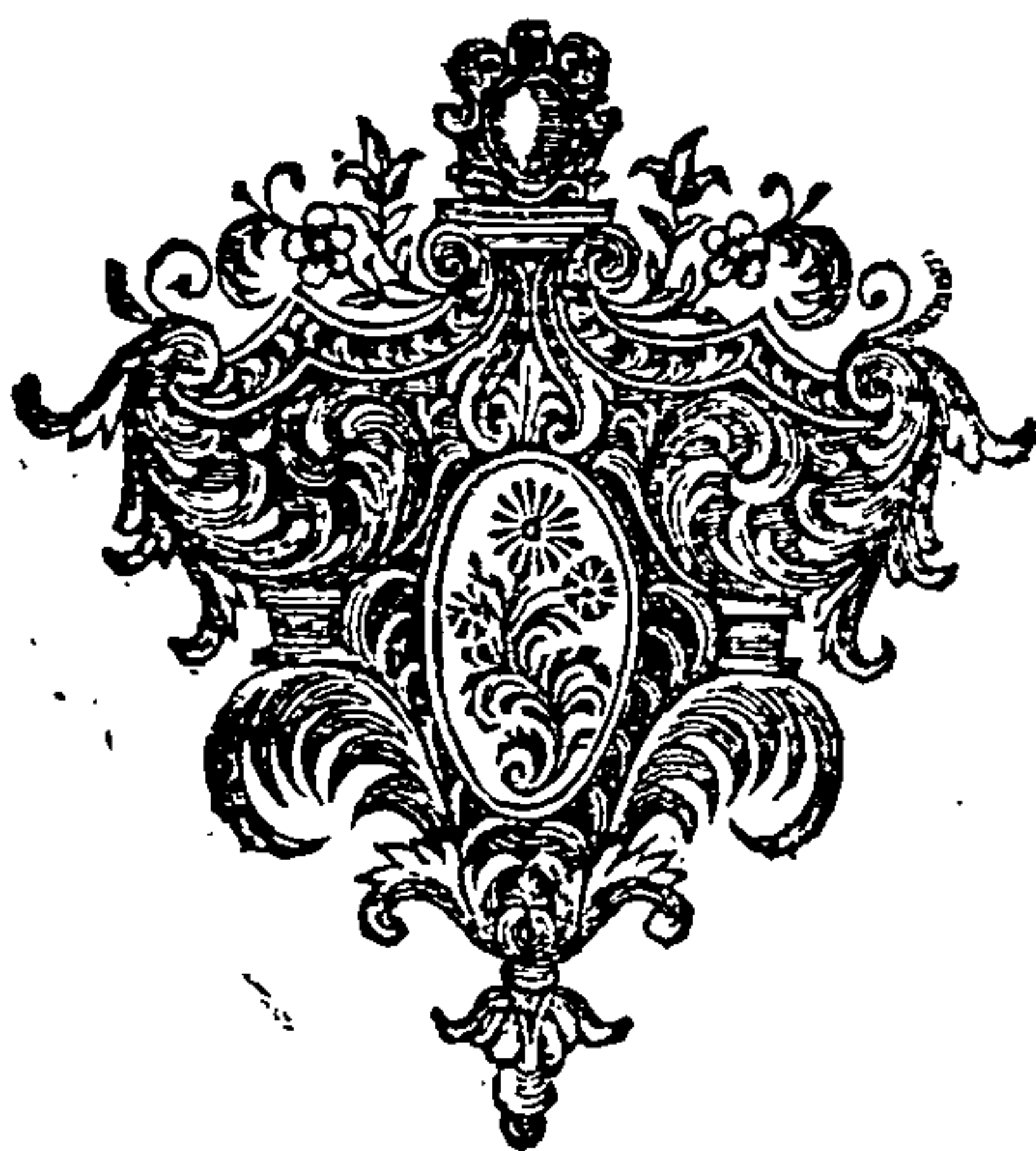
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Some of my Correspondents have promised to add very considerably: So that 'tis to be hoped, the University may expect to have a Garden in some tolerable Order by the next Spring, if the Gentlemen, who are inclined to contribute towards it, do not delay their Benefactions.

In my Design of it, I shall rather endeavour to render it neat and useful than expensive; for unless the Entrance of it happens to take up something extraordinary in its Ornaments, which indeed ought to carry a Grandeur with it, becoming the Illustrious Body to which it belongs, the other Parts may be disposed in such a Manner, as to perform the several Offices for which they are intended, without extraordinary Pomp in the Building; for in this Case, the Curiosity and Health of the Plants is to be preferr'd before the gay Contrivance of the Edifice. In all the Physick Gardens abroad, we find this Rule observ'd, viz. that the Conservatories are so contrived, as to humour the Nature of the Plants they are to preserve, without being ty'd up by any particular Order in Architecture. And I have observed, that in all the pompous Edifices which I have seen in England, for the keeping of Exotick Plants, the true Design of such Buildings has been so little understood, or regarded, that scarce three of them have answer'd the End they were built for; so that what with the Expence of such Buildings, and the ill Success that has attended them, our Gentry have been prejudiced against

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gainst Exotick Plants so much, that they have look'd upon them as a Rent Charge, without receiving any manner of Pleasure or Advantage from their Expence; when really the Fault has only been in the wrong Judgment of the Builder, who for want of knowing the Temper of the Plants he was to build for, has miscarry'd in his Undertaking; and 'tis for this Reason, that the fine Fruit call'd the Ananas, or Pine Apple, is yet so rare among us; but I hope, in a little Time, to demonstrate the Facility of cultivating this, or any other choice West or East Indian Fruit, in England.



T H E



T H E I N T R O D U C T I O N .

T is no less surprizing than unfortunate, that the Husbandry of the Ancients has not hitherto been made familiar to our *English* Gardiners and Husbandmen; since every one who has maturely consider'd the Works of COLUMELLA, VARRO, CATO, PALADIUS, &c. must have discover'd many extraordinary Things in those Authors, for the benefiting of Estates, by Planting, Sowing, Grassing, Feeding of Cattle, and of Enriching of Ground by other Means, unpractis'd in our Days; tho' in the ancient Times, they were of great Profit to the Lords of the Soil.

The Reasons which I suppose has kept these Great Men from appearing in *English*, are, either because the Terms of Husbandry have not been so well understood by the Readers of them, as to render them intelligible to our *English* Husbandmen; or else, that the Gentlemen, who were Admirers of these Authors, could not spare Time to put them into our Language; or it may be, the Difficulty of reconciling the antient Practice, to that of the Moderns, or of bringing the *Italian* Management to be agreeable to an *English*

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lish Climate: Perhaps, I say, some Reasons of this Kind, may have prevented the Translating these Works into *English*.

When I consider these Things, I cannot enough lament the Want of Learning among the Gardiners of this Nation; who in their spare Hours, were they Men of Letters, might very greatly improve themselves by reading the Works of the Ancients, and bringing their several Propositions to Practice; and also might bring to Light many of the most hidden Branches of the Art of Gardening, and have the Pleasure of producing several Effects, as good and useful, perhaps, as most of those that are call'd Modern Discoveries. For upon a deliberate Perusal of COLUMELLA, VARRO, and the other Gentlemen I am to descant upon in the following Work, I find many excellent Pieces, which have not hitherto been made common with us; many more that have not yet been try'd in our Fields and Gardens. The Graffing in the Root, (which is the readiest Way of propagating any Plant, and is the most certain Way of performing that Operation) was given us lately by Dr. *Agricola* of *Ratisbon*, from these Authors; and it is as rational to think, that several other Things mention'd by them will be of no less Use, when they are made easy to our Practitioners: In such a Case, there is some Hopes too, that they will be try'd and set on Foot, because the Generality of those who profess Gardening will sooner incline to work upon the Foundation of those Men who are dead and out of the Way, than of any of their Contemporaries.

In the Prosecution of this Design I shall, as near as possible, give the Sense of the Authors upon the several Heads they have treated of; but as they are a little tedious in some of their Accounts, I believe I may be excusable, if I do not
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insert every Thing they have written. If I can give my Reader the Marrow of them, in such a Manner as to render them intelligible, and adapt their Works to his Use, 'tis all I aim at: And I promise myself a good Account of this Work, as it contains a Fund of pleasing and profitable Subjects, which neither our Husbandmen or Gardiners have hitherto been acquainted with.

My Design is, to bring the Authors I have mention'd into as narrow a Compass as possible; and digest them in such a Manner, that, at one View, we may see their several Opinions upon each Head. I confess, I am in some measure oblig'd to some of their Commentators, but they are not without their Faults, which I shall endeavour to rectify; and especially, I shall take care to modernise their Terms of Art, and make their Kalendar agreeable to that of our Times; to which, also, I shall add the Difference there is between the Seasons of *Italy*, where these Authors had their Residence, and our Seasons in *England*; so that I cannot suppose it will be difficult for any one to put these Works in Practice: But as far as my Authors pin their Faith upon *Augury*, or the Wit of Astrologers, or Increase and Decrease of the Moon, or such like strange Superstition, I shall take the Liberty of leaving those Things where I found them; I not having been able yet to discover in all my Practice, that a Plant would grow one Hair's Breadth the more, because a Couple of Crows flew over it when it was planted, or that Plants are less vigorous, since the late triple Conjunction of the primary Planets; nor that there are more double Flowers rais'd by putting Seed into the Ground in the Increase of the Moon, than are produc'd, when we sow them in the Decrease. It is the more substantial Part of their Works, which I shall propagate. Their Farms are excellently design'd,

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and there are Beauties even in their Gardens, which we have not with us. The Culture of their Vines, and the making of Wines, as well as the propagating of Olives, and the making of Oyl, is set forth by them in a very rational and practical Way; and, since I have experienc'd that both these Plants, the Vine, and the Olive, may be cultivated in *England* in open Ground; their Methods of Management will add very much to the Design I have long since had of introducing Vineyards and Olive-Gardens among us. The Cytisus. is a Plant they very much commend for the feeding of Cattle, and as that Plant is very free of Growth, as well as easily rais'd, we may very well bring it to Use, and considerably improve our Cattle by it. This is a Branch of Husbandry, which has not yet been cultivated in *England*, but may vastly improve some of our idle Lands; and also the Medica, which Sort of Trefoil (tho' it is known to our Botanists) has not yet been brought to a right Use with us, tho' the Antients lay a great Stress upon it. There are many other Things which they practis'd in their Farms, that I think, will also be very agreeable to the People of this Nation to cultivate, and will tend greatly to enrich the Country; all which I shall relate in their proper Order.

C H A P.



C H A P. I.

*Rules to be observ'd, by those who study
Agriculture, from COLUMELLA.*



Whoever studies Agriculture must resolve to follow these ancient Rules: Prudence in the Management; the best Way how to lay out his Money; and a Resolution in what he does: For, as *Tremellius* says, that

Man is the likeliest to have a Piece of Ground truly cultivated, who has both Skill, Ability, and Will to look after it: For the Knowledge, and the Will are not alone sufficient for such an Undertaking without a Purse: And again, a Will to act, and to lay out Money, will avail nothing without Art; which is the chief Thing to be consider'd in all Business. In this Lesson, especially in Agriculture, the Will, and the Purse without Knowledge, will frequently occasion great Damage to the Owner: such Work done without proper Direction, frequently disappointing him both in his Money, and Expectations: So that a diligent Farmer, who delights in improving his Ground, and in following a sure Method of enriching himself, will take Care to consult the most experienc'd Hus-

bandmen of his Time, upon all Occasions, and diligently search the Commentators on the Ancients, and to weigh all their Sentiments and Precepts, whether every Thing they wrote answer to our modern Agriculture, and where they differ. I have found many valuable Authors, who have been perswaded, that when Ground has lain fallow a long Time, it is exceedingly alter'd in its Quality; and they tell us, that their great Astrologer, *Hipparchus*, has given out, there will be a Time when all Nature shall be chang'd, and the World unhing'd: Which also *Saserna*, that famous Author, seems to believe: For in his Book of Agriculture, he supposes such a Change of the Heavenly Bodies, that those Countries, in which formerly neither Grape nor Olive would thrive, by Reason of the violent Rigour of the Winter-Season; (that rigorous Season being chang'd into a gentle Heat) we shall then see a noble and flourishing Appearance of Vines and Olives, in Countries, which were before unnatural to them. But let us leave these Things, whether true or false, to Astrology. As to other Rules of Agriculture, there is no dissembling of them; and, as many *Punick* Authors have writ much on that Subject, yet many of our modern Husbandmen have argu'd them to be false; as *Tremellius*, who complaining of the same Thing, yet makes this Excuse; that the Soil of *Italy* and *Africa*, being of different Nature, cannot produce the same Effect. But yet, whatever Difference in Opinion there may be between the Ancients and those of our Time, on this Subject, let it not deter a young Beginner from Learning and Reading; for we find far many more Things among the Ancients to be approv'd of, than to be rejected. And as there are great Numbers of *Greeks*, that have written on this Subject; so the famous *Hesiod* has contributed no small Honour to this
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our Profession. It has also great Helps from those wise Men, *Democritus*, *Abderites*, *Socraticus*, *Xenophon*, *Tarentinus*, *Architas*, *Aristotle*, and *Theophrastus*, as well as from *Hieron*, *Epicharmus*, *Philometor*, and *Attalus*, who took no small Pains in it; *Athens* also produc'd many Learned Authors, *Cheras*, *Aristandros*, *Amphilochus*, *Chrestus*, *Euphronius*, but not *Amphipolites*, as some Authors imagine; tho' he also was a great Man in that Way, &c.

But that we may make Agriculture a free Denizen of *Rome* (for hitherto, we have only mention'd the *Greek* Authors in that Way) let us mention *M. Cato* the Censor, who first taught it to speak *Latin*; after him, the two *Sasernaes*, Father and Son, brought it to great Perfection; and after these, *Scrofa*, *Tremellius*, who made it eloquent, and *M. Terentius*, who polish'd it; besides *Virgil*, who gave it Majesty by his Verse.

And let us not forget his Schoolmaster, *Julius Higinus*. But after all, let us pay the greatest Veneration to *Mago*, the *Carthaginian*, as the great Parent of Agriculture: For those twenty eight Volumes of his, so valuable, were by Order of the Senate, turn'd into *Latin*. Nor did those two great Men, our Contemporaries, *Cornelius Celsus*, and *Julius Atticus* deserve less Praise. For *Cornelius* compris'd the whole System in five Books: He wrote one Book in particular relating to Vines, whose Scholar, *Julius Gracinius*, transmitted to Posterity in two Volumes on the same Subject, in an Eloquent and Learned Style: Therefore, before we make any Contract with Agriculture, call a Council of these great Men; but yet so as not to submit every Thing to their Judgment; for the Writings of such Authors will rather give us the Rudiments of the Art, than make us compleat Artists. Experience is above every Thing in all Arts: Nor is there any Dis-

cipline to be learn'd without some Miscarriage in the Learner; and whenever we come to be sensible of our Fault, we then shun the Rock we split upon, and the Authority of the Teacher puts us in the right Way: So that our Rules do not pretend to make perfect Husbandmen, but to assist them; nor can any one pretend to be Master in this Art by Reading only, without some Knowledge of the practical Part, and the help of a good Purse: So that we lay down these Rules as Instructions to young Students, not sufficient of themselves to make a Husbandman, without the other Helps. But still all these Things we have mention'd, will not be effectual without the watchful Eye of the Master, when his Servants are at work; just as it is in an Army, in the Absence of the General, all Duty is neglected.

And I think the Maxim of *Mago*, the *Carthaginian*, in the Beginning of his Book of Husbandry, is worthy our Notice, where he says, Let a Farmer constantly reside in the Country, to reap the full Benefit of his Farm; for he who loves a City Life, can have little Prospect of Advantage by his Designs in Agriculture.



REMARKS upon CHAP I.

MY Reader may gather from the foregoing Relation, how much the ancient *Greeks* employ'd their Time in the Study of Husbandry, and how commendable that Study was among the *Romans*; all which, *Columella* was very well appriz'd of, when he wrote this Chapter; for it appears by his extraordinary Commendations of the Authors he has mention'd, that he had fully weigh'd their Works, and sufficiently prov'd them: So that we have

have the Sum of all that had been done before his Time, in the Work now before us; we may observe too, that he had been so careful in trying the Experiments recommended by them, that he found some few Imperfections in 'em, and therefore we may necessarily conclude, he has given us nothing which he found impracticable in their Works. He insists very much upon the Master of a Farm's being always upon the Spot where his Farm is, which makes the greatest Part of a Chapter, that he has wrote immediately to follow this; but I think there will be no Occasion of translating it, since the latter Part of the above Chapter signifies the same Thing; but however, as there are some useful Hints in it, I shall not let them escape the View of my Reader: He very well observes, that no Estate in Land will bring its full Value where there is Want of Industry. One ought (*says he*) continually to walk over our Land, and carefully to view every Nook, to consider the Nature and Quality of the Soil, and every Day to observe the State of our Crops: We must every Hour consult which are in a State for gathering, and which want Encouragement, and above all, observe, that none of the Ground lie idle, which too often happens when the Business is left to a Servant; and sometimes for want of this Caution, an Estate does not bring in half a Crop. I have known several Gentlemen complain of this, that they were balk'd in their Expectations; notwithstanding (*say they*) we had honest Husbandmen, the Farm, which the last Year brought in perhaps four hundred Pounds, has not this Year return'd two hundred and fifty; this may happen either because the Season has not been so favourable one Year as the other, or that the Crops did not bear the same Price in the Markets one Year as the other, and not from the Dishonesty of the Husbandmen, or else it might happen from the different Way of ordering the Estate in one and
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the other Year, or an Husbandman might have better Success in his Management of one Crop, than another. For there are some Crops which require less Care than others; and some which require such a watchful Eye, that if they are not cut almost to a Day, half the Crop will shed, and be lost; and there are some Crops likewise which are subject to suffer extremely by the Birds, at certain Periods of their Growth, but by the watchful Eye of the Master, such Evils may be prevented; but the Woods, as well as the Fields, should be carefully visited, all decaying Trees cut down, and young ones planted in their Room; and such as grow too close in their Boughs, let them be thinn'd. observing to cut those Boughs we take away, close to the Body of the Tree, for if we leave only Stumps of half an Inch long, they will shoot forth great Numbers of Twiggs, which will grow knotty, and rob the Bole of the Tree of its Nourishment. Nor should we be less careful in examining the State of our Flocks and Cattle, that we may enjoy all the Advantages they may afford us. Our Poultry too, must be carefully look'd after, that they may yield us the full Advantage we ought to expect from them. Nor must the Bees lie unregarded, though they indeed are both wise and diligent enough to collect their Harvest; but as they are not without powerful Enemies, the Master of a Farm may sometimes, perhaps, lose considerably, if his Bees are insulted and over-power'd; besides the Loss now and then of a Swarm, if they are not often watch'd: Nay, our Fish too must not lie neglected; for, if our Ponds are such as they can breed in, they will soon be over-stock'd, and the Fish will not feed in them; and moreover, Water-Rats, and Otters, besides the ravenous Fish, sometimes destroy our Undertakings of this Kind. How necessary therefore is it for the Farmer to be constantly upon his Ground! What a vast Variety of Affairs has he to cultivate!

vate! Happy therefore is the Farmer who knows the Nature of his Ground, has a cool Head, and a long Purse. Columella further adds, when he speaks of the Choice of a Farm, that Part of it should be in the Vale, and the other Part Hilly, gently rising to the East or South, and that it should be a rich Soil. He is undoubtedly much in the Right to chuse Hills as well as Vales, well knowing, that Plants of different Kinds love different Situations, as well as different Soils, which must of necessity be met with in a Farm that is made up of high and low Grounds.

Virgil, in his Second Book of *Georgicks*, shews us how necessary it is to consult the Soil before we set about our Work; that by a right Knowledge of it, we may only cultivate such Plants upon it, as are natural to it.

*Nunc locus arborum ingeniis : quæ colores cunque ;
Quis color, & quæ sit rebus natura ferendis.*

That is, we are to learn the Temper and Quality of our Ground, the Depth and Substance of our Soil, and the Colour too; and then to consult carefully, what Plants are natural to such a Soil, and which Plant will grow the most freely upon it; for if we do not take Care to assort our Plants to our Soil, we must not hope for any tolerable Success.

Virgil again, in the same Book, very well explains what he means by poor and rich Ground, where he says,

*Pinus item quæ sit tellus, hoc denique pacto
Discimus : haud unquam manibus jactata fatiscit,
Sed picis in morem ad digitos lentescit habendo.*

That is, the Earth is poor, which when we have press'd it in our Hands, is apt to crumble and fall into small Parts; this light open Soil he esteems barren, but the Earth which sticks to the Hands, some-

somewhat like Pitch, such as our strong Loam, he commends for its rich Qualities. In another Place, he says,

*Salsa autem tellus, & quæ perhibetur amara,
Frugibus infælix : Ea nec mansuescit arando ;
Nec Baccho genus, aut pomis sua nomina servat.*

Which informs us, that such Earths as are salt or bitter to the Taste, are by no Means proper for Husbandry, nor can be mended by the Plough ; neither the Vine nor any other Kind of Fruit, no more than other Plants, can thrive in these unhappy Soils. *Frugibus infælix*, intimates that such Soils as he speaks of, are maligne to all Sorts of Plants ; he here speaks in general Terms, as well as when he says, *Aut Pomis, &c.* he means all of the Pomiferous Race or Apple-bearing Tribe ; which, according to all the Botanists of Note, were either Pears, Quinces, Oranges, Lemons, Citrons, Pomegranates, besides what we call Apples, as may be easily found in the great Mr. Ray's Works : But as most of the learned World have endeavour'd to discover what the forbidden Fruit was, and they have all of them been so puzzled in the Search, that it is not yet determin'd ; they give the general Name of *Apple* to the Fruit of every Tree. But let us proceed to enquire a little farther into *Virgil's* Judgment of Lands, as far it concerns this Chapter.

*Humida majores herbas alit, ipsaque jussu
Latior ; ah nimium ne sit mihi fertilis illa,
Neu se prævalidam primis ostendat aristis !
Quæ gravis est, ipso tacitam se pondere prodit ;
Quæque levis. Promptum est oculis prædiscere nigram,
Et quis cui color. At sceleratum exquirere frigus
Difficile est ; Piceæ tantum, taxique nocentes
Interdum, aut Hederæ pandunt vestigia nigra.*

The Meaning of which is, that moist Grounds bring all Sorts of tall Grain, such as Corn, *Maiores Herbas*, (distinguish'd from Grass which is of the same Tribe) in such Luxuriance, that it seems to promise ~~the~~ Hundred Fold, or such a Crop as will sufficiently reward the Farmer for his Labour. But *Virgil* very wisely, and with a great deal of good Nature warns us, against pinning our Faith too much upon the rich Appearance of Things; for as he observes, they bring but little Fruit, *i. e.* their Value lies all in outside Shows; long Straws bring but thin Ears.

*Ab nimium ne sit mihi fertilis illa,
Ne se prevalidam primis ostendat aristis!
Quæ gravis est, &c.*

The prolifick or fertile Earth is known by its superiour Weight; the least productive, by its extraordinary Lightness. We must have also, says he, a strict Regard to the Colour of the Earth; but whether it be of a cold Constitution, is a little difficult to determine: However, the cold Soil, he tells us, may be known by producing Firrs (of which the Pitch-Tree, or *Picea*, is one) the Yew and the Ivy are others, which love to grow in a shady and cold Situation. He again informs us how necessary it is to observe, that we do not transplant any Thing from the Nursery into worse Ground, than the Mother Soil they were rais'd in.

*At si quos haud ulla viros vigilantia fugit;
Ante locum similem exquirunt, ubi prima paretur
Arboribus seges, & quo mox digesta feratur,
Mutatam ignorent subito ne semina matrem.*

We are inform'd by these Lines, that those Husbandmen, who have a nice Regard to their Profit, always study to make their Nurseries of Plants,
in

in such a Soil as is suitable to the Ground where they design to transplant their Trees into; that after a Tree has been us'd to one Diet, it may not be ravish'd from that to another Kind, which has less Nourishment in it: And then he goes on;

*Quin etiam cæli regionem in cortice signant :
Ut, quo quæque modo steterit, qua parte calores
Austrinos tulerit, qua terga obvertcrit axi,
Restituant.*

Which signifies *Virgil's* great regard to place every Tree that is to be remov'd, in the same Position that it stood in the Nursery; that is, the Part which originally stood towards the South, must be set to the South when it is transplanted, and then the other Sides must be right of Course. He tells us too, that, for this End, the Husbandmen mark'd the Bark of their Trees before they took them up, to prevent Mistakes; and indeed, since I have examin'd this Particular, I must confess, that when the Trunks of Trees have been cut, I found the annual Rings which make the Increase of the Stem, were not regularly circular; but whatever had stood the most exposed to pinching Winds, were the narrowest, and the Parts of the Rings were set closer together than the other Parts of the same Rings which were exposed to a more favourable Situation. But this is enough for this Chapter, which is design'd for the Husbandman's general Information.

C H A P. II.

The Roman Kalendar, compar'd with our English Account of Time; wherein the several Seasons are consider'd, as they are in Italy, and how far they differ from those in our English Climate; for the better regulating the Directions given by Columella and Paladius; with Remarks.



BEFORE I enter upon the Scale by which the Romans measur'd their Time; it will be necessary I observe that the Roman Months were divided into Kalends, Nones, and Ides; all which were reckon'd backward. The Kalends are the first Days of every Month, according to our *English* Months; as *Calendis Januariis*, is the first Day of *January*, and *Pridie Calendarum*, or *Calendas*, the last Day of every Month; as *Pridie Calendarum*, is the 31st of *December*, III Kal. the 30th, IV Kal. the 29th of the same Month, &c.

The Nones being IV, follow the Kalends; as IV Non Jan. is *January* 2. III Non. Jan. 3. Prid. Non. is Jan. 4. and Nonis Jan is Jan. 5.

In *March*, *May*, *July*, and *October*, there are six Nones; and after these the Ides in each Month are eight, as VIII. Id. Jan. i.e. *Octavo Iduum vel Idus*, is *January* the 6th, and so till you come to the Ides themselves; *Idibus Januariis*, is *January* 13.

We are to note, that when the Accusative Case is used, the Præposition *Ante* is understood; and 3 *Calendas*, *Nonas*, *Idus*, we must read *tertio ante Calendas*, *Nonas*, *Idus*.

After the Ides, which are on the 13th Day of eight of the Months, and on the 15th of the other four, which have six Nones a-piece; the Kalends following are to be reckon'd to the next Month.

Januarius.

Januarius,

January.

English Account.	Roman Account.	Of the Rising and Setting of several Constellations, observ'd by the Roman Husbandman.	Weather common in England in January.
1	Kal. Jan.	Cancer Sets	<p>In this Month we generally expect our most severe Frosts, and such as are of long Continuance; with Snow at this Time, much more than in any other Part of the Year. But particularly, it is to be observed, that the highest Places are the most subject to these Severities of Weather; for I have observ'd, when the Hills in Oxfordshire, Northamptonshire, and Berkshire, &c. are frozen and cover'd with Snow, the Ground in the Vales near them, have been free and open; which I suppose, is, not only because they lye lower and more shelter'd than the Hills; but because they are always of a more generous Soil than the Hills; the Hills I mention are chiefly Chalk, which Chalk consists of Particles of fine Sand; which being bound together by a viscous Matter, renders it tough; but by great Rains, which by degrees, wash the Surface of these Hills into the Vales; the viscous Matter, which at first held the Parts of Sand together, are wash'd away, and they become a free and open Soil, not subject to freeze. We observe too, that in England, those Places lying near the Sea, are less subject to Frosts than the Inland Counties; and therefore Columella very wisely directs, that the Husbandman must regulate his Work according to the Seasons and Weather.</p>
2	IV Non.		
3	III Non.		
4	Prid. Non.		
5	None		
6	VIII Id.	Delphinus Rises Midd. of Winter	
7	VII Id.		
8	VI Id.		
9	V Id.		
10	IV. Id.		
11	III Id.	Sun Ent. <i>Aquar.</i>	
12	Prid. Id.		
13	<i>Idus</i>		
14	XIX Kal.		
15	XVIII Kal.		
16	XVII Kal.	Lyra or <i>Fidecula</i> Sets.	
17	XVI Kal.		
18	XV Kal.		
19	XIV Kal.		
20	XIII Kal.		
21	XII Kal.		
22	XI Kal.		
23	X Kal.		
24	IX Kal.		
25	VIII Kal.		
26	VII Kal.		
27	VI Kal.		
28	V Kal.		
29	IV Kal.		
30	III Kal.		
31	Prid. Kal.		

Remarks

Remarks upon January.

COLUMELLA, in his Eleventh Book, gives us an Account of the Weather common in every Month, in his Part of *Italy*, and of the Works to be done in the Seasons ; he mentions the rising and setting of certain Constellations, (which he judges, portends what Winds will blow) and from thence, concludes what Weather will happen ; but whether he had experienc'd what he relates of the rising and setting of Stars, that they occasion'd Change of Weather, or that he took it from his Predecessors, I cannot determine ; however, his first Observations are just and reasonable : We shall, (*says he*) give some Rules for what is to be done every Month : Laying down this general Rule, that we must accommodate all our Works in Husbandry, as the State of the Weather shall permit, the Variety and Change of which, if the Farmer will observe as he ought to do, he will hardly ever mistake. The Great Poet tells us, Let the Husbandman begin to break up his Ground in the Beginning of the Spring, but I do not advise him to be so very nice, as to join with the Astrologers in thinking one Day, more or less, will break Squares in an Affair of this kind, or that the Beginning of the Spring depends only upon a single Day ; he must watch his Opportunity when the Weather is gentle, and the Ground open, that he may work with Pleasure ; and he will often find such in Part of the Winter, that is, when the Severity of the Cold is over. He may act in all his Works of Husbandry, about the Ides of *January*, being the first *Roman* Month, and then not only compleat what he had left unfinish'd, but set out afresh for the succeeding Year, if the Weather does not hinder. I advise, that if he follows these Directions, he begin every Work about the Middle of the Month, which is recommended to him ; because even fifteen Days Difference may not be very untimely, if he observes the Rule given above, that we must consult the Weather, nor can any Work seem to be done too hastily, that has taken fifteen Days to do it in.

In the Ides of *January*, the Winds are high, and the Weather uncertain.

Februarius,

February.

English Account	Roman Account	Roman Account of the rising and setting of several Constellations.	Account of Weather common in England in February.
1	Kal.		<p>About the Beginning of this Month, the great Frosts begin to leave us; it has been observed, that Rain and Snow generally fall in great Quantities; however, for the last four or five Years, this Month has been warm and pleasant; so that our Farmers have set about such Works as they did not use to undertake 'till <i>March</i>; especially the sowing of Barley, and have been successful in it; for now they find their Grain will soon rise, the Earth having a Body of Moisture in it, which cannot well be exhal'd, before the Grain sprouts. But when this Work is deferred 'till <i>March</i>, it often happens, that the Corn does not come up through the Dryness of the Season. In a word, it is best to put in all our Crops for Summer, as soon as the Ground is open, and the Rigour of the Frost is over; but we must always have this Maxim before us, that as the Plants are more or less tender that we design to propagate, so are the Seeds of them; the most hardy may be sown first, the most tender not 'till the Beginning of <i>May</i>.</p>
2	IV	<i>Lyra</i> , and Mid.	
3	III	(of <i>Leo</i> sets	
4	Prid.	<i>Delphinus</i> sets	
5	Non.	<i>Aquarius</i> sets	
6	VIII		
7	VII		
8	VI	(of Spring	
9	V	The Beginning	
10	IV		
11	III	<i>Arctophylax</i> rises	
12	Prid.		
13	Idus	(<i>Anguis</i> rise	
14	XVI	<i>Corvus</i> , <i>Crater</i> , and	
15	XV		
16	XIV	Sun enters <i>Pisces</i>	
17	XIII		
18	XII		
19	XI		
20	X		
21	IX		
22	VIII		
23	VII		
24	VI		
25	V		
26	IV		
27	III		
28	Prid.		

Of the Roman Weather in February, from Columella, which he tells us the Rising and Setting of the several Constellations portend. With Remarks.

THE Eighteenth of the Kalends of *February*, (says Columella) the Weather is seasonable: The Seventeenth of the Kalends of *February* (which is the sixteenth Day of our *January*) the Sun enters *Aquarius*; and the same Morning *Leo* begins to set; at which Time, the South or South-West Wind brings Rain. The Sixteenth of the Kalends of *February*, *Cancer* begins to set, which brings Rain and Stormy Weather. The Fifteenth of the Kalends of *February*, *Aquarius* begins to rise, and then the South-West Wind portends seasonable Weather. The Eleventh of the Kalends of *February*, *Lyra* sets in the Evening, and brings rainy Weather. Upon the Ninth of the Kalends of *February*, upon the setting of the *Pisces*, seasonable Weather happens. On the Sixth of the Kalends of *February*, the bright Star in the Lion's Heart, sets, and very often signifies moderate Weather. The Fifth of the Kalends of *February*, the Wind is either South or South-West, and brings Rain. The Third of the Kalends of *February*, *Delphinus*, and *Lyra* or *Fidecula*, begin to set. *Prid. Kal. Feb.* or the Day before the Kalends of *February*. The setting of those Constellations which we have mention'd, causes seasonable Weather. I have given this Account of the Weather, that the Farmer may the better govern himself in his Business. Thus far Columella, of the Weather in Italy, and of the Winds that reign there in this Month. The Exactness with which he seems to write in this Case, I suppose, he has either borrow'd from the Astrologers which he mentions, or

else from some Weather-Book which he has kept himself; but as he does not name the particular Year, but rather informs us, that it's constantly so upon the rising and setting of the Constellations, I suppose the former. We must observe, however, that the Weather and Winds are much more constant upon the Continent, than they are or can be in any Island, especially the Winds are very regular between the Tropics, as is evident to those in the Trade-Winds; and so every Place, the nearer it is to either Tropic, has, without Doubt, the Winds more regular than those Places which are more remote from them. At this Time of the Year, in *England*, we have generally the Winds blowing from the East and North, and so continue shifting about to the North, now and then, 'till the Beginning of *May*; when we have now and then some more favourable Breezes from the South, which generally bring warm Showers.

I suppose, the Reason of the Uncertainty of Wind and Weather in an Island, such as *England*, which has great Seas to the East and West of it, may happen from the great Exhalations from those vast Bodies of Water, which sometimes are influenc'd by the Sun, one more than the other; and as the Bodies of those Seas are not equally extensive, so the Vapours rising from the largest Body, will likely produce more turbulent Winds, than the Vapours rising from the smaller Body of Waters; and this, as I take it, is the Reason why our Westerly Winds in *England*, bring such Hurricanes with them, the Western Ocean being of an immense Extent, far surpassing that of the Sea on the Eastern Side of us; but that the Winds, which blow from the East and North, are more keen and sharp than either the South or the West, I account for thus: The East and North Winds, when they reign, are so impregnated with the Nitrous Parts from the Mountains of Snow and Ice, which mix their Parts with them, that they
are

are rather sharp than turbulent ; and again, they are not so subject to Squawls, as the Winds from the West: And for the South Wind, which now and then favours us. that comes from the Continent, which has been warm'd by the Sun ; so that we seldom receive it but with Pleasure, unless the Snows have began to melt in those Parts which it came from, and then it brings Cold along with it.

I the rather mention the Case of Winds becoming Cold, by mixing with the Effluvia of Snow or Ice ; because I have made some Remarks upon the tempestuous Weather, which often happens about the End of *May*, or in *June*, which has in all my Observations been brought in by Westerly Winds ; and again, I as surely find, that at such Times, large Islands of Ice and Snow are passing to the Southward in the Western Ocean, as I have been inform'd by several Captains of Ships that were then coming from our Plantations to *England* : Some of these Islands are so large, as to measure 60 Miles in Length, and yielding so great a Vapour, that for a Day's Voyage on one Side of them, the Weather has been so hazy, that the Mariners could not discover what they were, and this was accompany'd with so much Cold, that they imagin'd. they had mistaken in their Accounts, and got several Degrees too far towards the North ; but a Day or two explain'd the Matter, and gave them an Opportunity of surveying what they had been so much surpriz'd at. Now considering the extraordinary Heat of the Sun, at the Season these appear, the Vapour must be very considerable that rises from them, and 'tis no Wonder then, that as it expands itself, it presses the Air with Violence enough to cause Tempests, and carry Cold along with it. I shall defer setting down the Husbandry of the Antients as they practis'd in the several Months, till I have fully survey'd their Seasons, and compar'd them with ours ; so then will our Husbandmen be able to apply the ancient Rules to their own Use.

Martius,

March.

English Account.	Roman Account.	Roman Account of the Rising and Setting of the Stars.	Account of the Weather common in Engl. in March.
1	Kal.	The northern <i>Pisces</i> Sets	<p>In this Month according to a common Proverb in <i>England</i>, we must expect Variety of Weather; and indeed, it is seldom that this Month is not uncertain with us, which I suppose may happen from the Sun's greater Influence over that Part of the western Ocean near us, than it had in the preceeding Month; for by this, a much greater Vapour must rise from thence; and therefore the Easterly Winds are often turn'd aside, but often retake their Station again by the melting of the Snows, which begin at this Time about <i>Norway</i>, <i>Sweden</i>, and those Places which lye East and North East from us. I generally observe, that till <i>May</i> comes in, these Winds have a potent Struggle; but then the West Wind commonly prevails, and reigns chiefly till towards <i>December</i>. We have a Proverb, that a Peck of Dust this Month, is worth a King's Ransom; but that among our old Husbandmen, perhaps, may be regarded; because we have another Proverb, that makes the preceeding Month to be rainy, that it fills the Dykes or Ditches; and therefore when this Month is dry, the Farmer may set about his Work, and plough and sow.</p>
2	VI		
3	V		
4	IV		
5	III		
6	Prid.	<i>Arctophylax</i> Sets and (<i>Vindimiator</i> Rises.	
7	Non.	<i>Pegasus</i> Rises	
8	VIII	<i>Corona</i> Rises	
9	VII		
10	VI		
11	V		
12	IV		
13	III		
14	Prid.		
15	Idus		
16	XVII	The Mid. of <i>Scorpio</i> Sets	
17	XVI	<i>Milvius</i> Rises	
18	XV	The Sun enters <i>Aries</i>	
19	XIV		
20	XIII		
21	XII		
22	XI		
23	X		
24	IX		
25	VIII	The Spring <i>Equinox</i>	
26	VII		
27	VI		
28	V		
29	IV		
30	III		
31	Prid.		



Of the Roman Weather in March from Columella, which he tells us, the Rising and Setting of the several Constellations, portend : With Remarks.

COLUMELLA tells us, that the 16th of the Kalends of *March*, in the Evening, *Cra-ter* rises ; upon which the Wind changes. The 15 of the Kalends of *March*, the Sun enters into *Pisces*, causing sometimes windy Weather ; the 12 and 13 of the Kalends of *March*, the West and South West Winds bring Hail and stormy Weather. The tenth, *Leo* sets, and those Northern Winds, call'd *Ornitæ*, (which are said to blow for thirty Days together) begin. *At this Time the Swallow begins to appear.*

The 9 of the Kalends of *March*, *Arcturus* rises, and brings the *Corus* or cold North Wind, and sometimes Rain. The 8 of the Kalends of *March*, *Sagitta* begins to appear, and we have changeable Weather ; but so gentle, that they are call'd *Halion Days*, especially, in the *Atlantick*.

The 7 of the Kalends of *March* brings seasonable Weather, so that 'tis Time to set such Things as are fit to be cultivated in cold Places ; the planting of Cuttings, and the transplanting of those Things, which are already rooted, will do well at this Time ; having this in our View, that the more tender Sorts of Plants must stay longer without transplanting ; and this Work may yet be done, between the Kalends and Ides of the following Month, provided, the Country be not too hot ; for the cooler the Climate, the better it is for these Things.

The Graffing of Trees and Vines, also, in a warm Situation, may now be perform'd with good Success.

The 6 of the Nones of *March*, *Vindimiator* rises, with Winds blowing from the North.

The 4 of the Nones of *March*, the West Wind, or sometimes the South, brings Showers of Hail and Rain.

On the Nones of *March*, *Equus* rises, in the Morning, and the North Wind blows.

The third of the Ides of *March*, the Northern *Pisces* sets ; at which Time, there are Northerly Winds.

The Day before the Ides of *March*, *Argos* rises, and then the Winds alternately blow from the West and the North ; about this Time, Gardens are best cultivated ; but I shall speak more of that in another Place ; however, I cannot help taking notice, that the best Time of Pruning Vines, is from the Kalends of *March*, to the 10th of the Kalends of *April*, provided the Buds do not yet stir.

On the Ides of *March*, *Nepa* or *Scorpio* begins to set, and forebodes stormy Weather.

The 17 of the Kalends of *April*, *Nepa* sets, at this Time we have Storms of Hail and Rain.

The 16 of the Kalends of *April*, the Sun enters *Aries*, and then the West or the cold North Winds blow.

The 12 of the Kalends of *April*, *Equus* sets in the Morning, and we have Storms from the North.

The 10 of the Kalends of *April*, *Aries* begins to rise with Rain, or sometimes Snow.

The 9 and the 8 Kalends of *April*, is the vernal *Equinox*, or *Equinox* of the Spring, portending stormy Weather. Thus far *Columella*.

My Reader may observe by this Calculation, how much the *Italian* Spring is forwarder than ours ;
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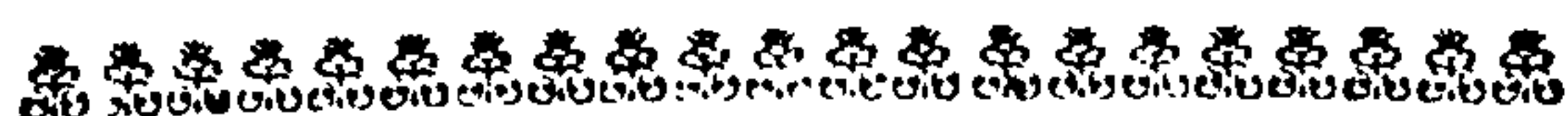
the coming of the Swallow, and the Halcion, or Kingsfisher, is about the 10th of the Kalends of *March*, which is our 20th of *February*, so that there is five Weeks difference, between the Time those Birds appear in *Italy* and with us, which is seldom sooner than the first Week in *April*; for there is nothing in my Opinion, can be a better Instance of the Temper of Air, in any Latitude, than the Flight of Birds of Passage; and by that alone, one may judge of the Change of Seasons in any Country; or compare the Difference between the Spring of one Country with another. When I speak of this Difference, between *Italy* and us, I suppose that Part of *Italy* where *Columella* practis'd Husbandry. We are not, neither, to suppose, that the Winds which are mention'd by *Columella*, are alike cold or hot, with those that we call South or North; for the North Winds with them, came from Places South of us, as our South Winds go from our Side to them again. Where their Spring is so much forwarder than ours, as six Weeks, their Autumn is as much later; so that Trees which are planted in such a Climate, have the Opportunity of perfecting their Summer or second Shoots: Some Peach-Trees only that were sent from *London*, to a Place near *Legborn*; by this means were grown in three Years, more than they would have done with us in six Years. But in my Remarks upon the following Months, I shall have Occasion to say more concerning this Difference of Climate.

Aprilis,

Aprilis,

April.

English Account.	Roman Account.	Roman Account of the Rising and Setting of several Constellations.	Account of Weather common in England in April.
1	Kal.	Scorpius Sets	When we enter this Month, all stormy Weather is generally past; the first Week is commonly so mild, that most of the Plants which have hid themselves under Ground, during the Winter Season, begin now to shew themselves; as the Asparagus, which without very extraordinary Weather in March, never shews its Buds till now.
2	IV	The Pleiades Set	
3	III		
4	Prid.		
5	Non.		
6	VIII		
7	VII		
8	VI	Libra and Orion Set	
9	V		'Tis likewise at this Time, that Nature opens her Stores, and unlocks the tender Buds of Trees, preparing them for the Generation of those Fruits she designs for our Summer's Entertainment.
10	IV		
11	III		The Swallow, the Nightingale, and the Cuckow now first begin to shew themselves, unless March has been very warm, and then have sometimes about the 25th of March; nay, once in my Time, the Month of February was so warm, that they were heard to sing in that Month; but cold Weather following soon after, they were again laid to rest till April began.
12	Prid.		
13	Idus		
14	XVIII		
15	XVII		
16	XVI	The Hyades Set	
17	XV		
18	XIV		
19	XIII	The Sun ent. Taur.	The Showers of this enchanting Month, are of great Use, both to the Fields and Gardens, in hatching the Seeds or Grain that have been sown this Spring; and besides, if we have such Showers in due Quantity, they destroy the little black Fly, which is us'd at this Time, to injure our young tender Crops.
20	XII		
21	XI		
22	X		
23	IX		
24	VIII		
25	VII	The Mid. of Spring,	
26	VI	Aries Sets, and	
27	V	Canis Rises.	
28	IV		
29	III		
30	Prid.		



Of the Roman Weather in April, from Columella ; which he tells us, the Rising and Setting of the several Constellations portend. With Remarks.

IN Columella's Account of the Weather and Situation of the Constellations, I find he differs in some Points from the *Roman Kalendar* ; so that his Farm was at some Distance from *Rome*. He tells us, that on the Eighth of the Ides of *April*, the *Vergilia* do not appear in the Evening, and then it is frequently cool Weather.

The Seventh of the Ides of *April*, as also the Sixth and Fifth, the South and South-West Winds portend Showers.

The Fourth of the Ides of *April*, upon the rising of the Sun, *Libra* begins to set, sometimes betokening fair Weather.

The Day before the Ides of *April*, the *Hyades* do not appear, and it is then very cool.

In this cool Season we should begin to stir the Ground about our Vines ; and those Works which were to have been done in *March* after the Equinox, must be now put in Execution. Figgs and Vines may now be grafted.

On the Ides of *May* *Libra* sets, and it is unpleasant Weather, with Rain, but not of long Continuance.

The Fifteenth of the Kalends of *May*, the Sun enters *Taurus*, foreboding Rain.

The Fourteenth of the Kalends of *May*, the *Hyades* do not appear in the Evening, which signifies Rain.

The Eleventh of the Kalends of *May*, which is about the Middle of the Spring, we have Rain, and sometimes Hail.

The Tenth of the Kalends of *May*, the *Pleiades* rise with the Sun, the South or South-West Winds blowing, bring Rain.

On the Ninth of the Kalends of *May*, *Lyra* appears, foreboding seasonable Weather.

The Fourth of the Kalends of *May*, the South-Wind commonly blows, and brings Rain.

On the Third of the Kalends of *May*, in the Morning, *Capra* rises, the Wind South, with some Rain.

Prid. Kalendas, or last of *April*, *Canis* does not appear in the Evening, portending seasonable Weather.

So far *Columella*, of the Weather of this Month; my Readers who are not yet well vers'd in the *Roman* Kalendar, may, by comparing his Observations with the several Months, be easily brought to understand it.

The Passage of Birds, as I have observ'd in one of the former Months, may very well inform us of the Temper of the Air in any Place, at the Time of their first Appearance; and from what I have observ'd in the Column of *English* Weather for this Month, we may reasonably infer, that our first fifteen Days in *April* are about the same Temperature in Point of Air, as the last fifteen Days of *February* in that Part of *Italy* that *Columella* speaks of, and it is my opinion likewise that the Waters in the same Part of the World, are alter'd in their Temper, as well as the Air; for in the Passage of Fish, such as Mackrel and Herrings, it is observable, they are ten or fifteen Days sooner or later, coming to their Stations, as the Temper of the Air is more or less cold; and Insects are no less sensible of it, as is observable in those which lie in their *Chrysalis* all Winter, or in Eggs; they hatch a Week or Fortnight sooner or later, as the Temper of the Air happens to be; and the same is also observ'd in the opening of the Buds of Trees, one Spring will be a Fortnight forwarder than another. But then the Husbandman has reason to be full of Fears, for a small Frost, when his Trees are in their tender Sprout, nay, a Wind, which happens to be a little brisker than ordinary, or a sudden hasty Shower sometimes nips them, or wounds them past Recovery for that Year, and sometimes kills the Trees.

But the more Northern Parts of the World, such as *Muscovy*, &c. are free from these Fears, there the Frost goes all off together; and in a day or two after the Ground is once open and free, I am inform'd by a Gentleman of Character, that the whole Country is cloath'd with Green: So sudden is the Vegetation in those Places where the Winters are so tedious, and the Summers so short; they have no Afterclaps, they leap into Summer at once, and they have certain Weather to perfect all their Crops.

The Uncertainty of our Seasons which oftentimes ruin our Winter Crops of Corn, &c. put me upon getting some

some of the Wheat and Rye from the North Side of the *Apennine* Mountains, which the Husbandmen sow there every Spring in *March*, and receive from them profitable Crops. I gave of these to several Gentlemen living in the most mountainous Parts of *England*, to try the Spring sowing of these Grains, and had their Promises to give me an Account of the Success; but hitherto they have not been so good as their Words; if they should happen to see this, it may perhaps put them in Mind: However, the small remaining Part which I left for myself I try'd upon the North Side of a Hill, digg'd up in a coarse Way, and I had very good Corn, but the Straw was short. 'Tis to be observ'd, that the *Apennine* Hills on the North Side, seldom part with their frosty Weather 'till *March*; and if it was not then that they had Corn which would bring a full Crop in a Summer, the People on that Side must want Bread. It is here, as I have related of *Muscovy*, the Spring is bold, and flings off the frosty Weather at once, and their Summer is short. In these mountainous Places, which are without the Tropics, there is as much Difference in Point of the Vegetation of Plants, between the South Side and the North, as if there were 6 or 7 Degrees Difference in Distance; therefore the Corn I speak of, to be sown on the North Sides of Hills, must certainly do better to be sown in the Spring than in the Winter, or the End of Autumn; when it must be very uncertain. But whether these Grains are of a particular Kind or not, I shall yet advise our Husbandmen to try the sowing of Winter Corn on the North Side of cold or springey Hills, as soon as they can open the Ground in the Spring; and if the Weather should prove a little more favourable than ordinary, let the Corn be eat down by Sheep, when it begins to appear rank, or is about four Inches high, that will make it spread at the Roots, and increase the Number of its Ears; but let not the Sheep lie too long upon it; put in a Number of them that may crop the Spot we put them upon, in two Days; if it is a narrow Slip, a few Hurdles may confine them.

Maius,

May.

English Account	Roman Account	Roman Account of the Rising and Setting of several Constellations.	Account of the Weather common in England in May.
1	Kal.	<i>Capella</i> rises	In this Month the Weather is generally hot in the Day-time, but the Evenings are the contrary; the first 15 Days are indeed a little doubtful, now and then pretty smart Frosts happening in the Nights. In the Way of Gardening with us, it is dangerous to trust our tender Exotick Plants abroad, 'till about the last Week. I speak now of the Parts about London; but along the South Coast of England, that Part of the Country is a Fortnight forwarder than ours. In this Month we have commonly very dry Weather, but the Dews make amends for it; 'tis now, that the smaller Plants, such as Herbs which are Natives of this Climate, and some of our Trees have finish'd flowering, and begin to shew us what Seed or Fruit we may expect the following Season. Mind now to water young planted Herbs or Trees, 'till they have got good Roots.
2	VI	The <i>Hyades</i> rise	
3	V	<i>Centaurus</i> rises	
4	IV		
5	III	<i>Lyra</i> or <i>Fidis</i> rises	
6	Prid.	The Mid. of <i>Scorpius</i> (sets)	
7	Non.		
8	VIII		
9	VII		
10	VI		
11	V	<i>Orion</i> sets.	
12	IV	(begins)	
13	III	<i>Pleiades</i> set, Summer	
14	Prid.	<i>Taurus</i> rises	
15	Idus		
16	XVII		
17	XVI		
18	XV		
19	XIV	Sun enters <i>Gemini</i>	
20	XIII		
21	XII	<i>Canis</i> rises	
22	XI		
23	X		
24	IX		
25	VIII	<i>Aquila</i> rises	
26	VII	<i>Arctophylax</i> sets	
27	VI	The <i>Hyades</i> set	
28	V		
29	IV		
30	III		
31	Prid.		



Of the Roman Weather in May, from Columella, which he tells us, the Rising and Setting of the several Constellations portend. With Remarks.

COLUMELLA, in his Account of this Month, tells us, that on the Sixth of the Nones of *May*, the *Hyades* rise with the Sun, the North Winds blowing.

The Fifth of the Nones, the whole Body of the *Centaurus* appears, and the Weather seasonable.

The Third of the Nones of *May*, the same Constellation portends Rain.

Prid. Non. Nepa, or the Scorpion, is half set, signifying seasonable Weather.

On the Nones of *May* the *Vergiliae* rise in the Morning, the West Wind blowing.

The Seventh of the Ides of *May* Summer begins, the West or North Wind blowing at that Time, and sometimes Rain.

The Sixth of the Ides of *May*, the *Vergiliae* appear in a full Body, the Wind West or North, and sometimes Rain.

The Third of the Ides *Lyra* rises in the Morning, denoting seasonable Weather.

On the Ides of *May* the South or South-East Winds blow, and sometimes bring wet Weather.

The Fifteenth of the Kalends of *June* we have South or South-East Winds, with some Rain.

On the Fourteenth of the Kalends of *June* the Sun enters *Gemini*.

The Twelfth of the Kalends of *June* the *Pleades* rise, bringing sometimes North Winds, with Rain.

The

The Tenth and Eleventh of the Kalends of *June*, *Arcturus* sets in the Morning, signifying seasonable Weather.

The Eighth, Seventh, and Sixth of the Kalends of *June*, *Capra* rises in the Morning, with Northerly Winds.

Thus far *Columella* of the *Italian* Weather in this Month.

As I have taken Notice before, that it sometimes happens, if we sow our Summer Corn too late in the Spring, it will not come up that Season ; so it is necessary to observe in this Place, that when there have been Rains that have fallen in *May*, some Farmers have then sown Barley, and have had good Crops that Summer. It happens now and then that *March* and *February* are so dry, that the Clay Grounds cannot be ploughed ; and then if this Month, or *April*, happens to be rainy, it is not too late to put Barley into the Ground ; nay, I have even known Barley sown in *June*, that has brought a good Crop. But, however, let not this give any Encouragement to the Farmer to neglect his Business, when he can have Opportunity of putting in his Crops early in the Spring, I would have him always doubt of Rain in these Months. What I have said, intimates only, that if the Spring has shut him out of the Ground, he may not be without Hopes of doing even at this Time of Day, what he could not in the proper Season. But enough of this, let us now proceed to examine the next Month.

Junius,

Junius,

June,

English Account	Roman Account	Roman Account of the Rising and Setting of several Constellations.	English Account of the Weather common in June.
1	Kal.	<i>Aquila</i> rises	<p>In this Month we have excessive Heats, excepting only when the Westerly Winds bring Storms, and if it then happens that the Islands of Snow and Ice are passing along the Western Ocean, as I have mention'd in the former Months, we have sharp Weather. In Hilly Places, this Month seldom passes without Storms of Hail and Thunder, even so violent, as to destroy the Corn and Fruit; but this Weather is less frequent in the Plains. This Year, 1724, we have receiv'd terrible Accounts of Storms that have happen'd in <i>Sussex</i>, <i>Leicestershire</i>, <i>Gloucestershire</i>, &c. where the Hail-Stones were so large, as to measure six Inches about, by which the Hops, Corn, and Fruits were entirely destroy'd. But so happy is <i>England</i> in its Variety of Situations, that if all the Crops among the Hills are lost, the Plains will yet afford enough Corn and Fruit for the People of <i>England</i>, and enough likewise to help our Neighbours.</p>
2	IV	The <i>Hyades</i> rise	
3	III		
4	Prid.		
5	Non.		
6	VIII		
7	VII	<i>Arctophylax</i> sets	
8	VI		
9	V		
10	IV	<i>Delphinus</i> rises	
11	III		
12	Prid.		
13	Idus		
14	XVIII		
15	XVII	The <i>Hyades</i> rise	
16	XVI	<i>Orion</i> rises	
17	XV		
18	XIV		
19	XIII	Sun enters <i>Cancer</i>	
20	XII	<i>Ophiuchus</i> rises	
21	XI		
22	X		
23	IX		
24	VIII		
25	VII		
26	VI	Summer Solstice	
27	V		
28	IV		
29	III		
30	Prid.		



Of the Roman Weather in June from Columella; which he tells us, the Rising and Setting of the several Constellations portend; with Remarks.

ON the Kalends of *June*, the Season is windy, and sometimes brings Rain.

The 7th of the Ides of *June*, *Arcturus* sets, and the West or North Winds blow.

The 4th of the Ides of *June*, *Delphinus* rises in the Evening, with a Westerly Wind, and great Dews.

On the Ides of *June*, the great Heats begin.

The 13th of the Kalends of *July*, the Sun enters *Cancer*, the Weather seasonable.

The 11th of the Kalends of *July*, *Anguifer* sets in the Morning, the Weather seasonable.

The 8th, 7th, and 6th of the Kalends of *July*, is the Summer Solstice, with warm Winds from the West.

The 3d of the Kalends of *July*, the Season is windy. So far *Columella* of the Stars and Weather. The Kalendar calculated for *Rome*, which I give my Reader, at the Beginning of every Month, has now done with the Observations of that Kind; so that we are oblig'd to *Columella* for the Remarks he gives us through the other Months, of the Rising and Setting of the Constellations. I must take Notice, however, that this Month is the properest Time to remove Trees, provided they are planted in Mud, prepar'd of fine Earth and Water, even with the Fruit on them; small Plants may be transported from one Place to another, in such a Mud as we speak of in Bladders, that have been dipt in warm Water, which renders them soft: But larger Plants may be remov'd several together in Tubs of Mud, to any Distance; and will be very well worth the While of those, who have thought of planting, only in the Decline of their Life.

Julius,

Julius, July.

English Account.	Roman Account.
1	Kal.
2	VI
3	V
4	IV
5	III
6	Prid.
7	Non.
8	VIII
9	VII
10	VI
11	V
12	IV
13	III
14	Prid.
15	Idus
16	XVII
17	XVI
18	XV
19	XIV
20	XIII
21	XII
22	XI
23	X
24	IX
25	VIII
26	VII
27	VI
28	V
29	IV
30	III
31	Prid.

The Roman Kalendar gives us here no more Account of the Rising and Setting of the Constellations: But Columella, his Account at the Bottom of this Month, will explain it to us according to the Latitude he liv'd in; and by comparing his Account, with the Account in the Roman Kalendar, for the preceeding Months, one may find perhaps the Difference between his Situation, and that of Rome, or else mend one Account by the other.

English Weather in the Month of July.

This Month is commonly very dry and hot; all the Trees that are Natives of *England*, as well as most Kinds of Fruit Trees, have now finish'd their Summer Shoots; and for the first 15 Days seem to be at a Stand, and about the End begin their second Shoot. We may now observe the Buds, already set for blossoming the next Year, which every Gardiner should understand, to govern him in his Winter Pruning.

'Tis now we prepare our Ground for Winter Crops of Turneps.



*Of the Roman Weather in July from
Columella ; which he tells us, the Rising
and Setting of the Constellations portend ;
with Remarks.*

ON the Kalends of *July*, the West Wind blows,
and sometimes the South, the Season sultry.

The IV of the Nones of *July*, *Corona* sets in the
Morning.

Prid. Non. of *July*, *Cancer* is half set ; sultry
Weather.

The VIII of the Ides of *July*, *Capricornus* is half
set.

The VII of the Ides of *July*, *Cepheus* rises in the
Evening, and denotes fair Weather.

The VI of the Ides of *July*, the Winds call'd
Prodromi begin to blow ; these Winds reign eight
Days before the rising of the Dog Star.

On the Ides of *July*, *Procyon* rises in the Morning,
signifying seasonable Weather.

The XIII of the Kalends of *August*, the Sun
enters *Leo*, the Wind Westerly.

The IX of the Kalends of *August*, the bright Star
in the Lions Heart rises, sometimes denoting sea-
sonable Weather.

On the VIII of the Kalends of *August*, *Aquarius*
begins to set early in the Evening, the West or
South Wind blowing.

The VII of the Kalends of *August*, *Canicula* ap-
pears. Sultry hot Weather.

The VI of the Kalends of *August*, *Aquila* rises.

The IV of the Kalends of *August*, commonly
seasonable Weather.

The

The III of the Kalends of *August*, *Aquila* sets, denoting fair Weather.

My Reader may take notice, that in *Italy* the Sun is much hotter in this Month than in *England*; and the Heats are so excellive, that after ten in the Morning, 'tis hardly possible to live out of Doors; 'tis now the Time when every one contrives a cool Apartment, partly underground, with Jetts or Falls of Water to fan the Air and refresh the Spirits; 'tis this extraordinary Heat which ripens the Water Melons, a Fruit which will not ripen in *England*, but with the greatest Care, and the Assistance of artificial Heats. Wherefore it is plain, that the Heats in *Italy* are much more powerful than with us; tho' some are apt to think the contrary.



<i>Augustus,</i>		<i>August.</i>	English <i>Weather in the Month of August.</i>
English Account	Roman Account		
1	Kal.		<p>This Month the Weather is generally very hot, and commonly dry till towards the End ; and then Showers begin to fall, and the Nights are cool ; 'tis a busy Month among the Husbandmen and Gardiners, in preparing for Winter Crops, as well as providing for laying up of Winter Stores ; 'tis this Month the Vintage begins in <i>Italy</i>, even of such Grapes as ripen the latest with us, which still is an Instance of the extraordinary Heat of the <i>Italian</i> Climate, and that our Summers in <i>England</i>, are not so hot as they are in <i>Italy</i> ; and moreover denotes, that the <i>Italian</i> Climate is full six Weeks forwarder in the ripening of Fruits than ours is.</p>
2	IV		
3	III		
4	Prid.		
5	Non.		
6	VIII		
7	VII		
8	VI		
9	V		
10	IV		
11	III		
12	Prid.		
13	Idus		
14	XIX		
15	XVIII		
16	XVII		
17	XVI		
18	XV		
19	XIV		
20	XIII		
21	XII		
22	XI		
23	X		
24	IX		
25	VIII		
26	VII		
27	VI		
28	V		
29	IV		
30	III		
31	Prid.		



Of the Roman Weather in August from Columella ; which he tells us, the Rising and Setting of the Constellations portend ; with Remarks.

ON the Kalends of *August*, the (*Etesian*) Easterly Winds blow.

The Day before the Nones of *August*, *Leo* is half set, the Weather seasonable.

The 7th of the Ides of *August*, *Aquarius* is half set, the Weather close and hot.

The Day before the Ides of *August*, *Lyra* sets in the Morning, and Autumn begins.

On the Ides of *August*, the setting of *Delphinus* brings seasonable Weather.

The 19th of the Kalends of *September*, the early setting of this Constellation, is a Sign of seasonable Weather.

The 13th of the Kalends of *September*, the Sun enters *Virgo*, which denotes fine Weather, this, and the following Day ; but sometimes we have Thunder, also *Lyra* sets on this Day.

The 10th of the Kalends of *September*, we have mild Weather.

The 7th of the Kalends of *September*, *Vindemiator* rises in the Morning, and *Arcturus* begins to set, and sometimes brings rainy Weather.

The 3d of the Calends of *September*, *Virgo* begins to rise, and the Easterly Winds leave off blowing ; we have now cool Breezes with Storms of Hail and Rain.

Prid. Kalend. Sept. Andromeda rises in the Evening, sometimes bringing Storms of Hail and Rain. Thus far *Columella* of *Italian Weather in August*.

This Month in *England* produces Specimens of Fruits of all Sorts, but many of the principal Kinds are now in their Prime ; we have Peaches, and the *Bruxelles* Abricot, some Grapes, Plums of several Sorts, and some good Pears and Apples of the forward Kinds, and excellent Figs, and Melons. So that 'tis now those Gentlemen who have Gardens, may reap the Pleasure and Advantage of them, to be upon the Spot where their Fruit is growing.

Septembris, September.

English Account	Roman Account
1	Kal.
2	IV
3	III
4	Prid.
5	Non.
6	VIII
7	VII
8	VI
9	V
10	IV
11	III
12	Prid.
13	Idus
14	XVIII
15	XVII
16	XVI
17	XV
18	XIV
19	XIII
20	XII
21	XI
22	X
23	IX
24	VIII
25	VII
26	VI
27	V
28	IV
29	III
30	Prid.

English Weather in the Month of September.

'Tis this Month only we have to trust to, for the ripening of our later Fruits, but 'tis not always we can boast of fine Weather, for that Work; for we have sometimes wet Weather enough, to rob us of our Hopes; and tho' the Summer Season has been favourable, yet too much wet at this Time, renders our Fruits either harsh or insipid; and besides, the frosty Nights which are not uncommon at this Season, restrain the Skins and Rind of the Fruits, and make them tough and sour; and then, we must also observe, that the Sun's Heat is very much lessen'd, however hot it may seem to us; for the cool Evenings and Mornings, make us more sensible of warmth, when the Sun now shines out, than when we have a continu'd Series of warm Summer Weather. In a Word, if our Fruits were not well prepar'd for ripening before this Season, we can hardly expect them in great Perfection, unless they were to be cover'd with Glasses.

Of the Roman Weather in September
from Columella ; which he tells us the
Rising and Setting of the Constellations por-
tend : With Remarks.

THE Kalends of September, the Weather is hot.

The 4th of the Nones of September, the *Piscis Austrinus* disappears, the Weather hot.

The Nones of September, *Arcturus* rises, the West or North Winds blow.

The 7th of the Ides of September, the Northern *Piscis* is not quite set, and *Capra* rises. Fine Weather.

The 3d of the Ides of September, *Virgo* is half risen, and we have then the West or North West Winds blowing.

On the Ides of September, we have commonly seasonable Weather.

The 15th of the Kalends of October, *Arcturus* rises, the West and South West Winds commonly blow ; but sometimes the East, which some call *Vulturius*.

The 14th of the Kalends of October, the *Spica Virginis* rises, the Wind blowing from the West or North.

On the 13th of the Kalends of October, the Sun enters *Libra*, and *Crater* appears in the Morning.

On the 11th of the Kalends of October, both *Pisces* set in the Morning ; and also *Aries* begins to set, the West, or North Winds commonly blowing ; but sometimes the South, with some Showers.

On

On the 10th of the Kalends of *October*, the Ship *Argos* sets, portending seasonable Weather, and sometimes Rain.

On the 9th of the Kalends of *October*, *Centaurus* begins to rise in the Morning, denoting seasonable Weather, and sometimes Rain.

About the 8th and 7th of the Kalends of *October*, is the Autumnal *Equinox*, denoting Rain.

The 5th of the Kalends of *October*, the *Hædi* rise, the West, or sometimes the South West Wind, blowing with some Rain.

On the 4th of the Kalends of *October*, *Virgo* ceases to appear. Seasonable Weather. This ends *Columella's* Account of the *Italian* Weather this Month.

Now the *L'Azzeroli* are ripe, and Figs, and some of the finest Grapes, with Oranges and Citrons, are in great Perfection in *Italy*, and the South Parts of *France*; and by the End of this Month, most of our Fruits that are fit to eat from the Tree, are in as great Perfection as they will be; but for the rest which are to ripen in Winter; they should be left till about the Middle or End of *October* upon the Tree, to furnish themselves with as many Juices as possible, for then they will ripen freely in the House; but if they are gather'd before all their Vessels are full of Juices, and that those Juices begin to digest, the Fruit will shrink and be tough, and sour, tho' it be never so carefully preserv'd in the House; nay, even tho' it should be bak'd, it will never be tender, or be brought to its true Flavour. But the Way to be secure of this, is never to gather any Fruit, till it will leave the Tree without tearing; and then we shall not only be sure of good Fruit, but the Tree will likewise be preserv'd from such Wounds, as may destroy it.

Oſobris, Oſober.

English Account	Roman Account	English Weather in the Month of October.
1	Kal.	<p>I have observ'd that this Month, till about the 20th, is generally fair, and good Travelling Weather, the Air of the Day being temperate, and the Frosts, which sometimes happen in the Nights, moderate, and never lasting; but about the End, we are to expect our great Rains and dark Weather; there is one Good in Travelling in this Month, the Roads are found and hard, which they are not for a long Time after the Winter is over. 'Tis now our Husbandmen prepare their Grounds for Winter Corn, and our late Fruits should be gather'd: But let this be always the Rule in gathering Fruits, to let them be thoroughly dry, when they are gather'd, and free from Bruises; for one bruis'd Fruit, tho' it will not rot immediately, perhaps, yet if it be laid amongst an Heap of good Fruit, as soon as it takes the rot, all the rest will be soon infected, and after all our Pains, the best Part of our Crop will be lost.</p>
2	VI	
3	V	
4	IV	
5	III	
6	Prid.	
7	Non.	
8	VIII	
9	VII	
10	VI	
11	V	
12	IV	
13	III	
14	Prid.	
15	Idus	
16	XVII	
17	XVI	
18	XV	
19	XIV	
20	XIII	
21	XII	
22	XI	
23	X	
24	IX	
25	VIII	
26	VII	
27	VI	
28	V	
29	IV	
30	III	
31	Prid.	



Of the Roman Weather in October from Columella ; which he tells us the Rising and Setting of the Constellations portend.

THE Kalends of *October*, and the VI of the Nones, sometimes bring seasonable Weather.

The 4th of the Nones of *October*, *Auriga* sets in the Morning, and *Virgo* disappears, sometimes signifying seasonable Weather.

The 3d of the Nones of *October*, *Corona* begins to rise. Seasonable Weather.

Prid. Non. Octob. the *Herdi* rise in the Evening, and *Aries* is half set, with a North Wind.

The 8th of the Ides of *October*, the bright Star in *Corona* rises.

The 6th of the Ides of *October*, the *Vergilia* rises in the Evening, the West Wind, and sometimes the South-West blowing, with some Rain.

The 3d and *Prid. Id. Octob.* all *Corona* rises in the Morning, denoting cool Breezes from the South, and sometimes Rain.

On the Ides of *October*, and two Days after, is commonly seasonable Weather.

The 14th of the Kalends of *November*, the Sun enters *Scorpio*; on the 13th and 12th of the Kalends of *November*, at Sun rise, the *Vergilia* begin to set. The Weather seasonable.

On the 11th of the Kalends of *November*, the Tail of *Taurus* sets, the Wind Southerly, and sometimes Rain.

On the 8th of the Kalends of *November*, *Centaurus* disappears in the Morning, the Weather seasonable.

The 7th of the Kalends of *November*, part of *Scorpio* rises, the Weather seasonable.

The 5th of the Kalends of *November*, the *Vergilia* set, with sharp Frosts.

The 4th of the Kalends of *November*, *Arcturus* sets in the Evening. Stormy Weather.

The 3d of the Kalends of *November*, and *Prid. Kal. Nov.* *Cassiope* begins to set, the Weather seasonable.

Here *Columella* ends his Observations for *October*; and I cannot find any material Remark to make upon them, except it be, that throughout all the Months we have traced, he has not taken Notice of the Moon, to be at all concern'd on the Weather Account.

Novembris,

Novembris, November.

English Account.	Roman Account.
1	Kal.
2	IV
3	III
4	Prid.
5	Non.
6	VIII
7	VII
8	VI
9	V
10	IV
11	III
12	Prid.
13	Idus
14	XVIII
15	XVII
16	XVI
17	XV
18	XIV
19	XIII
20	XII
21	XI
22	X
23	IX
24	VIII
25	VII
26	VI
27	V
28	IV
29	III
30	Prid.

English Weather in the Month of November.

This Month is generally rainy, with Storms of Wind, and frequently great Snows fall at this Season, but seldom lye long upon the Ground; and also, we have now and then Frosts for a Day or two, and cold Mists; the Leaves are now all fallen from our Forest Trees, and a Winter Scene begins to appear every where.

The Winds are now about changing from the West to the East, by the North: If the Weather permits, our Husbandmen now begin to put their forward Crops of Beans and Pease into the Ground; for if they are set or sown sooner, they will get so high above Ground, before the Frosts begin, that if they happen to prove severe, the very forward Crops generally perish, first growing black in the Shank: But those sown the Beginning of this Month, will just have Time enough to get out of the Ground in a hardy Way, and resist the Frosts, and besides, will not require the Trouble of earthing up before the Spring.



Of the Roman Weather in November from Columella ; which he tells us the Rising and Setting of the Constellations portend : With Remarks.

ON the Kalends of *November*, and the Day after, the *Caput Tauri* sets, with rainy Weather.

The 3d of the Nones of *November*, *Lyra* rises in the Morning, with cold Rain.

The 8th of the Ides of *November*, the whole Body of the same Constellation rises, the Wind South or West, with cold Weather.

The 7th of the Ides of *November*, the bright Star in *Scorpio* rises, sometimes signifying seasonable Weather.

The 6th of the Ides of *November*, the *Vergilia* set in the Morning ; seasonable Weather.

The 5th of the Ides of *November*, is the Beginning of Winter, the Wind South or East, and sometimes misty Weather.

The Ides of *November*, is uncertain Weather, but generally mild.

The 16th of the Kalends of *December*, *Lyra* rises in the Morning, the Wind generally South, but sometimes a strong North Wind.

On the 14th of the Kalends of *December*, the Sun enters *Sagittarius* and the 7 Stars rise in the Morning ; the Weather seasonable.

The 12th of the Kalends of *December*, the Horns of *Taurus* set in the Evening, with a cold North Wind and Rain.

The 11th of the Kalends of *December*, the *Pleiades* set in the Morning ; winterly Weather.

The 10th of the Kalends of *December*, *Lepus* sets in the Morning ; the Weather seasonable.

The 7th of the Kalends of *December*, *Canicula* sets at Sun rising ; winterly Weather.

Prid. Kalend. Decemb. the *Pleiades* are quite set, the Wind at West or South, and sometimes Rain. Here *Columella* ends his Observations upon the *Italian* Weather in this Month.

It is to be observ'd that *Columella* in this Month mentions the North Wind to be cold, which hitherto he did not signify to us ; but now the Snows are fallen upon the *Alps*, and every Wind passing over those Mountains at such a Time, or rebounding from them, must necessarily be very cold ; for the Reason I have given before, where I spoke of the Islands of Ice, which pass along the Western Ocean in the Summer.

Decembris,

Decembris,

December.

English Account.	Roman Account.	English Weather in the Month of December.
1	Kal.	<p>The Weather in this Month is generally variable, sometimes, Sleet, Snow, cold Rain, cold Mists, Frost, and high Winds, hardly two Days together are alike, generally speaking; but the Year 1723, the Weather was so mild and open, that in several Places about <i>London</i>, there were green Apples upon the Trees, and great Numbers, both of Apple and Pear-Trees, and even Cherries were in full Blossom; in one Place near <i>Kingston</i> upon <i>Thames</i>, a Cherry-Tree against a Wall, was full of green Fruit, without any forcing; and Rooks had young Ones in several Places; the Robin Red Breast was likewise so much deceiv'd by the Season, that several Nests were found, some with Eggs, and others with young Ones, and I may truly say, that the Ground was then as capable of Vegetation, as I ever knew it in <i>September</i>.</p>
2	IV	
3	III	
4	Prid.	
5	Non.	
6	VIII	
7	VII	
8	VI	
9	V	
10	IV	
11	III	
12	Prid.	
13	Idus	
14	XIX	
15	XVIII	
16	XVII	
17	XVI	
18	XV	
19	XIV	
20	XIII	
21	XII	
22	XI	
23	X	
24	IX	
25	VIII	
26	VII	
27	VI	
28	V	
29	IV	
30	III	
31	Prid.	

Saturnalia for
7 Days.



*Of the Roman Weather in December
from Columella ; which he tells us the
Rising and Setting of the Constellations por-
tend : With Remarks.*

ON the Kalends of *December*, uncertain Weather.

On the 8th of the Ides of *December*, *Sagittarius* is half set, the Weather seasonable.

On the 7th of the Ides of *December*, *Aquila* rises in the Morning, the Wind South West, and sometimes South, cold Dews falling.

On the 3d of the Ides of *December*, we have commonly cold Winds from the North ; but sometimes the South Winds blow with Rain.

On the Ides of *December*, all *Scorpio* appears in the Morning ; winterly Weather.

The 16th of the Kalends of *January*, the Sun enters *Capricorn*, being the Winter Solstice according to *Hipparchus*.

The 15th of the Kalends of *January*, denotes some change of Winds.

The 10th of the Kalends of *January*, *Capra* sets in the Morning ; seasonable Weather.

The 9th of the Kalends of *January*, is the Winter Solstice according to the *Chaldeans*.

The 6th of the Kalends of *January*, *Delphinus* rises in the Morning ; the Weather seasonable.

The 4th of the Kalends of *January*, *Aquila* sets in the Evening, winterly Weather.

The 3d of the Kalends of *January*, *Canicula* sets in the Evening, signifying seasonable Weather.

Prid. Kal. Jan. windy Weather.

Here

Here *Columella* ends his Account of the Seasons in *Italy*; which, with the Remarks I add of the Seasons in *England*, may serve to acquaint my Reader how, not only this Author, but every other foreign Writer ought to be understood, when he treats of Husbandry and Gardening. The Birds of Passage, and the ripening of Fruits, may determine the Difference of Seasons between Place and Place; and when we have once found the Difference, the Husbandman cannot miss of his Aim, if he only follows the Method of doing what Authors of foreign Nations prescribe to him.

But as in this last Month, we find that the old *Romans* kept their *Saturnalia*, or Feast of *Saturn*, which was much about the Time of our *Christmas*; and as we are also inform'd, that those Feasts were celebrated by the *Druids* in this Country; I may take Notice of the Veneration they had for Plants and Trees, with which they adorn'd their Temples at such Festivals. In the Time of the *Druids*, the most stately Oaks were the Temples, or Places of Worship, which perhaps might have been chosen for that Use, because the *Druids* understood the Virtues of every Part of that Tree; besides, its noble Appearance, its lovely Shade, and the Value of its Timber.

— *Atque habitæ Graiis oracula Quercus.*

Says *Virgil* in his *Georgic*, Book II. the *Druids*, however their chief Employ was in Religious Affairs; they were not less capable of administering Physick to the People under their Cure: The Accounts we have of them tell us, that they were Men of universal Learning, and that the People look'd upon them as Oracles; they kept their Learning among themselves, and made the People Slaves to their Opinions; so much we can gather from the Accounts we have of them. But

I say, that besides, the Beauty and Use of the Oak, as I have mention'd above, the Use they made of the several Parts of it in the Cure of Distempers, might contribute not a little to enforce in the Minds of the ignorant People, such an Opinion of all they did, that they were esteem'd to be no less than Gods. If we consider, that the People of this Nation have been, from the longest Date, subject to Agues, and have been no less Strangers to Hysterick Cases; it may not be unreasonable to conjecture, that a People who were utterly void of Learning, and consequently ignorant of the natural Causes of Things, might be lead into a Belief, that either the Ague, or a Convulsion were the Effects of Witchcraft, or of some Diabolical Operation, to mention only these Cases. I say, the Power of relieving ignorant People, by the Virtue of Medicines taken from the sacred Oak, would be enough to perswade such People, that those Druids who administred such Medicines to them, could do any Thing.

The Bark of Oak, I find is as powerful in the Cure of an Ague, as the Jesuit's Bark, and the Misselto, from Experience; is as soveraign a Remedy in Hysterick Cases, which to be sure the Druids were not ignorant of, no more than of the Virtues of the Acorns, and Leaves of the Oak, and also of the Oak Berries, Oak Apples, and Polypody of the Oak, which are extraordinary Remedies in other Distempers, subject to human Bodies. The Use of the Misselto or Viscum, which seems to have been known in those Days, and highly esteem'd, from what we may find even in our Times still prevails among most People, *i. e.* that the *Viscum Quercinum*, or Misseltoe of the Oak, is only to be us'd, and not that of any other Tree. But give me leave to offer two or three Thoughts, which I have lately consider'd, concerning it.

In the first Place, let us observe, that it was the Custom at the Feasts of *Saturn*, to adorn the Temples or Oaks, which were at that Time unfurnish'd of Leaves, with Boughs of Trees that were ever green, such as the Bay, Juniper, Rosemary, Ivy, Cypress, Savin, Mistletoe, &c. and there yet remains so much Superstition among many of the Country People, that they yearly provide a fresh Bunch of Mistletoe to hang up in their Houses, as an Antidote against Witchcraft, as has been handed down from Father to Son, Time out of Mind. With the same View, the Country People of the last Century, planted Bay-Trees near their Houses; and so every Green that I have nam'd, carries some strange Story along with it: The Mistletoe, however, sometimes is found growing upon the Oak, tho' less frequent than we find it upon other Trees; however, I judge, that the Reputation this *Viscum* retains above others, proceeds from the great Quantities of it, among other Greens that were plac'd as Ornaments upon the Oaks, at the Time of the *Saturnalia*; and the People then might conclude, that all such Ornaments of their Temples became salubrious by the Sanction of the Druids. I should not indulge this Opinion, if I did not know, that we have but one Kind of Mistletoe in *England*; and that it may be very easily propagated upon any Tree, upon the Oak as well as any other, by sticking the Berries upon the young smooth Shoots of two or three Years old; so will the Seeds in the Berries begin to shoot in a few Months, and lay hold of the Bark of the Tree, and there remain growing for many Years; by this Means, the Tree which the Mistletoe grows upon, does no more than the Earth does to other Trees, which is to find them Nourishment: And I never yet heard that any Physician, when he prescrib'd Herbs or Plants of any Sort for his Medicines, did ever regard whe-

ther they grew upon a Chalk, a Gravel, a Clay, or a Sand; 'tis the Vessels which differ in every Sort of Plant, which filter the Juices of the Earth, so as to change their Qualities, that one kind of Herb shall not inherit the same Virtues as another. But suppose it should be objected, that the Mistletoe propagated upon any Tree, as I have directed, is rather a Graff growing upon a Tree, than a Plant taking Root in a Tree; yet it still makes no Difference: For were we to graff twenty Scions of one Sort of Pear, for Example, upon 20 Sorts of Trees, if it was possible to find so many different Kinds that the Pear would take upon; yet by the Uniformity of the Vessels in the Scions, they would all produce Fruit alike, resembling that of the Mother Plant they were taken from. And so the Mistletoe, whether it grows upon the Oak, the Beach, the Apple, the Pear, the Lime or any other kind of Tree whatever; its Virtues are still the same. It is very likely, that the Custom of adorning our Churches at the Celebration of *Christmas* was taken from those People who kept the Feasts of *Saturn*. But 'tis Time I now conclude this Chapter, and proceed to examine a little farther into the Ancient Husbandry.



C H A P. III.

Of the several Sorts of Dung us'd for Manuring of Land in Italy ; from Columella, Varro, Paladius, &c. With Remarks.

FROM Columella, Varro, Paladius, and others of the Ancients. I gather thus much concerning Stercoration, that there were three particular Sorts of Dung us'd for manuring of Land, viz. That of Birds, Men, and Cattle.

The best Dung of Birds, is that of Pidgeons, or what is taken out of a Dove-House ; the next to that is, what is voided by common Poultry ; but the Dung of Water Fowl, such as Geese, Ducks, &c. is rather pernicious than helpful to Ground.

We chiefly approve of the Pidgeon Dung, because we find by Experience, that a small Quantity of it sprinkled upon Ground, enriches it extremely.

As to that of Men, it must be mix'd with Soil taken out of the Streets, and then it will render Ground very fertile ; for it is of a very hot Nature of itself, and therefore should not be us'd alone.

For the helping of bearing Vines, Man's Urine is much better ; but it must first lye six Months to mellow, and digest before it be us'd ; there is nothing which contributes more to the Welfare of Vines and Fruit-Trees, than this, when it has

lain long enough to maturate, before we apply it to the Roots: This will make our Trees bear Abundance of Fruit; and above all, the Fruit will be much better relish'd, than by any other Means we can use, especially Grapes and Apples.

The Lees of Oyl, likewise, which have been kept till they have lost their Salts, being mix'd with this, is of extraordinary Service to Fruit-Trees, by being apply'd to their Roots; but especially, it is helpful to the Olive; but whether we mix our Oyl Lees with Urine, or not, we find it of great Service to the Ground: In the Winter, indeed, if we apply this Manure, then the Urine and Lees of Oyl are best us'd together, or we may use them in the Spring, before the Weather be too warm, that is, while our Vines and Trees have the Earth open about their Roots.

The third Sort of Manure is the Dung of Cattle, the best of which, is that of Asses; because those Creatures eat very slowly, and have a quick Digestion, and their Food presently passes through their Bodies.

The next to this is the Dung of Sheep and Goats, and likewise that of Horses and Herd Cattle is of Use; but the worst of all is the Dung of Swine.

Moreover, some Husbandmen use Ashes with good Success, and the Haulm or Stalks of Lupines, cut and laid to rot, is as good as the best Dung. This I mention, because there are some Countries, where there are not Cattle or Poultry enough to supply the Farmer with Dung; and in such a Case, he must provide other Means; he must be careful to gather Heaps of Leaves, from the High-Ways, or wherever he can find them, he may likewise cut Fern, without Injury to his Neighbour, but may rather oblige him by it, especially, if he cuts it while it is young; these he may mix with Ashes, and the Filth of a Jakes, and what he

he can get together of Things, that will easily rot, laying the whole in a Pit, till it is fit for Use: This I recommend to those who cannot have the Benefit of the Dung of Cattle: but where there are large Flocks or Herds, there will hardly be any Want of what I have mention'd above, the Cleanings of the Cow Houses, the Sheep Folds, the Kitchen, the Dairy, the Hen-House, and other such Conveniencies about a Farm, will sufficiently supply him with Manure enough for his Ground.

It is not of any great Moment to save any particular Sort of Dung by itself, for a particular Sort of Ground, but lay all together in a Pit, as is mention'd above; but if any one should be so curious, we shall inform him that the Dung of Goats and Fowls, may do the best for Corn, or Meadow Land.

The Magazine of Dung above-mention'd, being altogether in the Pit, must be kept moist continually, that the Parts of which that Dunghill is compos'd, may more easily rot, and become fit to lay upon the Ground; but especially, if we have put the Haulm or Stalks of any Plants among the Dungs, we must be sure to keep them moist, the better to rot, and destroy any Seeds that may happen to be among them.

In the Summer Time we must stir the whole Dunghill with Prongs, that it may rot the sooner, and that every Part of it may be equally prepar'd at one Time, for laying upon the Ground.

The Dung prepar'd in this Manner, which has lain long enough to be digested, is then full of Strength, and will not bring Weeds when it is laid upon the Ground; but Dung should be laid fresh upon Meadows, to render them the more fertile, which Work ought to be done in *February*, during the Moon's Increase, and it will greatly help our Crop of Hay.

Thus far I have given the Opinions of the ancient *Roman* Husbandmen, as far as it relates to the Choice of Dungs, or other Manures. I shall next observe, how far their Notions are agreeable to ours, and then enquire whether we have improv'd upon them.

As for the Dung of Fowls, principally which they commend; there are very few of our Farmers, if any, that have any Regard to it, excepting only the Dung of Pidgeons, and that is held in great Request by the Farmers, in and near the Isle of *Ely*, where they sow it upon their Corn Lands with great Success; but there indeed the Country is well stock'd with Dove-Courts, and they can provide Quantities of that, rather than of any other, and one Cart load of it will go as far as five or six of Horse Dung; this is the hottest of all Dungs, and abounds in Salts; but I would advise every one that uses it, to let it first lye some Time abroad to mellow, and not lay it upon the Ground immediately after 'tis taken from the Pidgeon-House.

I would likewise advise upon the Foot of what the Antients tells us, concerning the Dung of the common Poultry; that those who breed and fatten Poultry, would save all the Washings and Cleanings of their Chicken-Coops, or Hen-Houses, and in some Pit made in the Ground, which may be partly fill'd with Sand, which will imbibe those rich Parts, that otherwise would soak into the Sides and Bottom of the Pit; and when the Pit is fill'd, to carry away the Sand as well as the Dung, and not to suffer it to lye long upon the Ground before it is plow'd in; for I am of Opinion, that the Dung of Fowls consists of such fine Parts, that when it once comes to be spread upon Land, the Spirit of it will soon be exhaled and lost; and again, as this is only to be spread very thin upon Land, so we should rather har-

row it into the Ground than plow it in, unless the Plow does not cut the Ground above four Inches deep. Human Dung, which is so much commended by the Antients, is at this Day in great Use in *Italy*, especially, for manuring of Vines and Orange-Trees; but they are very careful to let it lye a convenient Time in Pits, till it is throwly mature, and has lost its foetid Quality before they use it, and even then they apply but a little at a Time; but I do not now find it is practis'd in *Italy* to mix it with other Soil, tho' undoubtedly, it is of that hot Nature, that as the Antients advise, it would be necessary to mix it with other Ingredients, were we to dress our Corn Lands with it, and even then to distribute it but in small Quantities upon the Ground, as we have said before of the Pidgeons Dung; but more of that hereafter.

The Nicety of some People, has perhaps kept them from using this Manure in their Gardens in *England*, or in those Fields which they cultivate for Corn, Pulse, or Herbs for the Table, believing that it will give an offensive Relish to their Fruits or Salads; but if they consider, that it must have first lost its foetid Parts, and must be so thorowly digested, that it is reduc'd to meer Earth before we use it, and that even then it becomes as it were incorporated with the whole Body of Earth and Air too; one can hardly expect any ill Relish from it, to shew itself in the Fruit of a Tree that has been manured with it, especially, considering what a prodigious Number of Vessels the Juices which every Plant receives from the Earth must pass through before they reach the Fruit. And I think what I have said in the preceding Chapter, concerning the Mistletoe, and the Nature of Graffs, may be sufficient to prove, that all the Juices which the Tree receives from the Earth, must be alter'd so much, that there is not the least Vestige to

to trace them by, to what they were at first; besides, the common Experiments, which one may make every Day, by tasting the Bark of a Tree, we find it vastly different in Taste from the Leaves of the Tree, and the Leaves from the Flowers, and the Flowers from the green Fruit, and the green Fruit from the ripe Fruit; all which are so many Evidences for what I say, concerning the altering of the Juices by Filtration; or is the Bark of a Tree the same to the Smell as the Leaf of the Tree, or is the Leaf the same to the Smell as the Flower, or the Flower as the Fruit; but these Juices receiv'd by a Tree from the Earth, besides the Alteration they receive by Filtration, are still chang'd by Fermentation, so that they are now no more like what they were at first, than the World is now like the Chaos it was fram'd from: But as a farther Instance of the Power of changing, and altering Liquid Bodies by Filtration; we may survey in the animal Body, how the Saliva, the Urine, the Sweat, and the Milk are all separated from the same Mass of Blood, and become different from one another, only by passing through Strainers of different Kinds; the Blood itself, however it is shocking to the View, yet proceeds from the Nourishment receiv'd greedily by the Stomach; and the Milk, which proceeds from the same original, becomes what it is, only by being filter'd through Strainers of different Forms, from those which produce the Urine; and the Milk by this Means is render'd agreeable, while the Urine is nauseous. Thus far of Secretion in a Natural Way, let us next enquire how far Bodies of any Kind may be chang'd in a Chymical Way.

In the Memoirs of the Royal Academy of *Paris*, for the Year 1711, we have an Account of a Chymical Experiment, that was made upon human Dung, in Order to extract from it, an Oyl, that should not be foetid with a Design of fixing Mercury:

ry : But altho' the desir'd End was not answer'd after many Tryals, which were made after different Manners ; yet there was one Discovery, which I think is not foreign to my present Purpose ; and that is, that after the Chymist had gone through as many Tryals as he could invent, he laid by all his Utensils in a bye Place, and neglected them for many Months, and then found that one of his Preparations, which was the most foetid when he left of working, was now become as high a Perfume as Ambergris, and of a Scent so like it, that they were hardly to be distinguish'd from one another, by the Olfactory Nerves. This is another considerable Instance how Bodies may be chang'd and alter'd, even so as to become direct Contraries to what they were at first.

But some may still object against what I have said, with Regard to Asparagus, that it is so much impregnated with the Particles of the Dung it is planted upon, that it immediately gives an unsavoury Smell to the Urine of the Person who has eaten of it ; in Answer to which, I joyn with them, that Asparagus will do what they say, but 'tis not from any Dung they grow in ; for I have had very good Asparagus in my own Garden, that had been rais'd from Seed upon natural Ground, and was planted in Beds of pure Earth, without any Sort of Dung, and it had the same Effect upon the Urine, as other Asparagus that had been educated with Dung ; so that 'tis the Nature of the Plant alone that occasions the Alteration of the Urine, and not any Power that it receives from Dung, which makes that Alteration.

But there is another Instance of the Alteration, and Change of the Juices of the Earth, by passing through the Vessels of a Plant ; and that is in the Cabage, which is always planted in Ground that is well dung'd ; and notwithstanding the Vessels of the Cabage are large, and the Plant
itself

itself but a Trifle compar'd to a Tree; yet upon cutting open the Head of a Cabage, we find an agreeable strong Scent, like Musk, which is very contrary to that of the Dung it took its Nourishment from. In a Word, Dung, let it be what Sort soever, only contributes to promote the Growth or Luxuriance of a Plant, and cannot communicate its natural Savour to any Part of a Plant; therefore I can see no Occasion for any one to object against the Use of any Kind of Dung, in either their Fields or Gardens, provided it is capable of adding to the vigorous Growth of a Plant.

After this, our ancient Authors recommend the Application of Urine to the Roots of Vines and Fruit-Trees, to make them not only bear well, but to add a Richness to the Flavour of the Fruit: I am very well satisfy'd, that this has been done in *England* to old Vines, and has made them shoot sooner than ordinary; and indeed such Vines never wanted Fruit, but I was too young to observe, whether the Vines that were so treated, ow'd their Fruit more to the Urine, or to the good pruning of them; but this I am sure of, that the Urine that was apply'd to them was fresh, tho' my Reason now informs me, that it must be much more profitable to Trees, after it has been kept some Time to mellow, as our *Roman* Husbandmen recommend; and that this cannot give any ill Relish to the Fruit of the Tree it is apply'd too, may be understood, from what I have said before concerning Dungs; notwithstanding the Opinion of an Uncle of *Columella's* to the contrary, which I shall have Occasion to mention by and by.

The next Manure taken Notice of, by the *Roman* Husbandmen for the Improvement of Vegetation, is the Lees of Oyl; the Oyl they mean, is the Cyl of Olives, which *Italy* abounds in; this they tell us particularly promotes the Welfare of the Olive-Tree, if it be laid to its Root, which
is

is very rational; for as it is the digested Juice of the Fruit of that Tree, it must certainly contain such Parts as must be nourishing to the Olive, and even the Pressings of the Olives, would be also very nourishing to any Tree of the Sort that they were taken from. I have experienc'd that the Pulp of the Fruit of Oranges and Lemons. being bury'd with the Seeds, have so invigorated the Seeds in their Growth, that they have shot three Times as much in one Summer, as those Seeds have done that I sow'd at the same Time, without the Pulp about them; and likewise the Kernels of Apples have shot a Foot in a Summer, that have been sown among the Pulp of rotten Apples, when the Kernels of the same Fruit have not made a Progress of above four Inches above Ground, that have been sown without the Pulp. The Lees of Oyl being to be had in *Italy*, in large Quantity, 'tis no Wonder it has been try'd there, among other Things, for the Improvement of Land; but the Scarcity of it with us, has been a very likely Reason why we have not practis'd it in *England*; however, since I have experienc'd, that Olives will not only live well with us in the open Air, but will ripen their Fruit too without any Trouble; I am not out of Hopes, that the Day will come, when I may see a good Part of *England* laid into Olive Gardens: But tho' we are not so well furnish'd with Olive Oyl, or the Lees of it; as to use them for the Improvement of Ground; yet our *English* Husbandmen who live near the Sea, are not without some Notion of the Benefits, which Oyl will bring to their Land; witness, the great Quantities of Fish, which they lay upon their Grounds, by Way of Manure, when they have had a plentiful Fishery, of Herrings especially, which are full of Oyl; this they account, is a Manure of as much Import as any other. This Sort I esteem best for the lighter Soils.

The

The next Manure which the Ancients take Notice of, is the Dung of Quadrupedes, of which they account, that of the As to be the best: In our *English* Practice, we find it is much stronger than that of the Horse; but I believe for all that, it is hardly worth our while to save them separately, if we design their Use only for Corn Grounds, for they must be well rotted, before we ought to lay them upon Land; but in some particular Cases, as for Hot-beds, and the Raising of Mushrooms, the Asses Dung is preferable to that of the Horse; but they observe these should be laid in a Hollow or Pit, and kept moist to rot the sooner; and as we practise in *England*, such a Magazine of Dung should be turn'd in the Summer with Forks, or Prongs, that it may be all alike when we come to use it. I may add one Thing more of the Practice of our *English* Husbandmen, that when they carry this Dung upon their Land, they take with it about 6 or 8 Inches deep of the Ground, the Dung has lain upon, which they account as good as Dung, for that it has a great Part of the Richness of it; this indeed is the most general Manure us'd by our *English* Farmers; or for want of it, they provide large Quantities of their worst Straw, and lay it in their Cow-Yards, or in the narrow Roads about their Farms to rot, which makes a good Manure for their Coarse and heavy Grounds.

Next to these, they recommend the Dung of Sheep and Goats, which as well as Deers Dung, is very enriching to Land, especially where the Soil is cold and stiff; as for the Dung of Sheep, it is us'd in *England*, with good Success, for Corn Lands, by folding the Sheep upon the Land we design to improve, and shifting the Fold every Night from Place to Place, 'till the whole Spot has been cover'd by the Sheep; but upon the Continent, this Method cannot be us'd, because of the great Number of Wolves; they are there forc'd

to house their Sheep at Nights, and so have an Opportunity of saving their Dung in Heaps, and with it a large Quantity of Sand, which make together an excellent Manure; their Method of doing it, is to lay a Bed of Sand at the Bottom of the Sheep-House, and after the Sheep have been upon it one Night, to cover it with a Bed of fresh Sand, and so continue to do every Day, till it rises to a good Height, and then take the whole out of the House, and lay it in a Heap; beginning again as they did before, and proceeding in the same Manner the whole Year about, by which Time, they amass a very large Quantity; and so the same may be done by the Goats, where there are great Flocks.

It is well worth our while, to gather together the Cleanings and Sweepings of the Sheep Penns in great Sheep-Markets, for the Use of a Garden: Some Gentlemen who have enter'd into this Thought, have contributed no small Matter to the keeping of the Sheep-Market in *Smithfield*, cleaner than it us'd to be; the Experience I have had of this Sort of Manure, shews me that no Preparation is better for Flowers or for Orange-Trees, after it has had due Time to digest.

The next Sort of Dung which we are to consider, is that of Kine, generally comprehended under the Name of Cow Dung; its Parts are extremely fine, as the Dung of all Beasts is, that chew the Cudd; but this Dung is of a cooler Nature than any I have yet treated of. The Farmers in *England*, especially about *London*, save this for their Grass Grounds, where they spread it about the End of *August*, even while it is very moist, and they fail not of a rich Winter Crop of Grass; the ancient Husbandmen prescribe this Sort of Dung for another Use, viz. to plant Trees in, as I shall mention at large hereafter.

The

The next Thing recommended by the Ancients for manuring of Land, is the Stalks of Lupines, cut and laid to rot; and Fern, and the Leaves of Trees, likewise, they advise for the same Purpose. Our *English* Husbandmen, altho' the Lupine is a Stranger to them, yet they are not insensible, that Vegetables rotted and reduced to Mold, make very rich Soil, which of Necessity must abound in vegetative Salts; 'tis not uncommon with us, to save the Leaves of Trees with the Sweepings of Wood Piles, and Fern, or any other Vegetable, which will not over run the Ground with Weeds; all these I say, make an excellent Compost; but let us take with us the Advice of these *Roman* Husbandmen, in keeping such Mixtures wet, in Order to rot them soon; and by this Means there is a Fermentation kept up in the Body of these Mixtures, which will destroy whatever Seeds there are among them. A Preparation of this Kind, when it is once fit for Use, will be very Light; and besides the rich Salts it may contain, will very much help to open stiff Land: In the Ashes likewise there are Abundance of the fix'd Salts of Vegetables, so that they likewise must greatly contribute to enrich Land; but they must be us'd sparingly, and only sprinkled upon Ground just before we harrow it. This was try'd with very good Success, by a Friend of mine, who had one Year made a great Quantity of Charcoal, and had several Loads of Coal Dust by him; and for rotted Wood and Leaves, it is to be suppos'd that cannot be wanting in Woods, that have stood an hundred Years. Two Years ago, I perswaded a Gentleman to be at the Expence of taking off as much of the Surface of his Wood Land, as he could easily come at, to carry upon his Corn Land, and he tells me, he never saw finer Wheat in his Life, tho' he did not value the Ground before at four Shillings *per Acre*: But we have now many

Instances

Instances in *Berkshire*, of the Excellence of rotted Wood, and Leaves of Trees for Corn, where they have grub'd up the Woods, and sown Wheat; but I cannot help at every Opportunity, when I have Occasion to mention the cutting down of Woods, to remind my Reader, to take care at the same Time, to plant when he cuts down; for without, I am sure *England* will soon be out of Stock of Timber.

Thus far of the several Sorts of Manures us'd by the *Roman* Husbandmen: In my Remarks upon them, we shall find which are, and which are not us'd with us; but we have many others, besides what has yet been mention'd, that are in great Esteem among the *English* Husbandmen, viz. Marle, for light Soil, Sea Coal Ashes, for heavy Soil, Chalk, Woollen Rags, Lime, Cakes of Lin-Seed, after the Oyl is press'd out, old Thatch, the Soil out of Ponds and Ditches, Sea Weed, Shavings of Horn, Sea Sand, or drift Sand. Rubbish of old Walls, and some others which I have mention'd in my Monthly Works. Having taken this View of the Manures of the Antients, I next proceed to enquire into the Seasons of the Year, that they chose to dung their Ground.



C H A P. IV.

Of the Roman Manner of Dunging of Ground; with the Seasons proper for that Work, from Varro, Paladius, Columella, &c.



BEFORE I enter upon the Manner of dunging of Ground, according to the Roman Writers, it will be necessary, that I explain what Space or Quantity of Ground that is, which the Antients call *Jugerum*; for I find some of our Dictionaries have mistaken it. The *Jugerum*, says *Columella*, is 140 Feet in Length, and 120 Feet in Breadth, which is somewhat less than our Acre, which contains 160 Square Rods of Ground, each Rod being 16 and $\frac{1}{2}$ Feet Square; however, as it is generally taken for an Acre by the Commentators on the Antients, we shall treat it as such in this Work, only making this Distinction between the *Jugerum*, and the *English* Acre, that I shall always call the *Jugerum*, the *Roman* Acre, whenever I have Occasion to mention it. The *Roman* Acre, however, we may observe, was call'd *Jugerum*, as it was just as much Ground, as a Yoke of Oxen could plough in a Day.

But to proceed to the Manner of dunging Ground, according to the antient Husbandmen; they tell us, that he that would prepare Ground for Corn, must bring the Dung upon it in *September*, if he designs to sow in Autumn; but if he sow
in

in the Spring, then he may bring the Dung or Manure upon the Land, any Time in the Winter; but be it which it will, let the Dung, as it is brought upon such Lands, be laid in little Heaps at convenient Distances, to be spread afterwards, in such a Proportion upon the Land, as it may require.

A *Roman* Acre of low, plain Ground, will take eighteen Cart Loads of Dung, but the same Quantity of Ground in the hilly Parts, will require 24 Cart Loads; but in either Case, let not the Dung be spread upon the Land, before it has lain some Time in Heaps upon it.

If any Accident should prevent the seasonable Dinging of our Land, we have yet a Remedy left us; which is, that before we begin to weed our Corn, we may strew among it some Pidgeons Dung, or the Dung of other Poultry, or for want of that, we may use Goats Dung, which together (with the Weeds that are puld or cut up, and may lye to rot upon the Ground) will make the Corn grow apace.

Every Husbandman ought to know, that as Ground which lyes too long without Dinging, must be starv'd; so that Ground which is too liberally fed with Dung, will parch and burn the Crops that are sown upon it; therefore it is much better to manure our Land often, than to over do it at once; we must observe too, that wet Ground requires the most Dung, and a dry Soil requires less; the first having its Parts strongly united, and bound together, and harden'd by Weather, is made tenderer, and has its Parts open'd by Dung; the other being naturally dry and light, is made much more so by large Quantities of Dung; therefore we should be very wary, that we are not too sparing in one Case, or that we are not too liberal on the other Hand. But if we should happen to have such Land, as will

not be benefited by Dung; than *Columella* tells us, it will be very proper to follow the Method us'd by his learned Uncle *M. Columella*, a very diligent Farmer, which was to lay Chalk or Marle upon Sandy Ground. and Sand upon chalky Ground, or other stiff Soils; by which Piece of Husbandry, he had large Crops of Corn, and the finest Vines in the Country; for he was utterly against manuring Vines with Dung, believing it spoil'd the Flavour of the Wine; and he judg'd, that simple Earth laid to their Roots, would make the Vines thrive better.

But if the Farmer should be without Dung of any Kind, Lupines will sufficiently make him amends, if when cut, they be scatter'd upon poor Ground, about the Ides of *September*, and plough'd in, he will soon prove them to be the best Stercoration: These Lupines likewise should be cut, and sprinkled upon sandy Ground, while they are in their second Flower, while their Stalks are tender, that they may rot the sooner.

Here we have the Substance of the Method of dunging Lands, as it was practis'd by the *Roman* Husbandmen, and handed down to us by their best Writers; their Advice concerning their laying the Dung in little Heaps when it is brought upon the Land, is very rational, since they recommend at the same Time, that those Heaps must not be spread till several Days afterward, for this saves the Expence of a great Share of Dung. for the Ground upon which every Heap of Dung stands, will imbibe a considerable Share of the Virtue of that Dung; and therefore need not have any Dung at all left upon it, when we come to spread the Dung abroad, for it will then be sufficiently enrich'd by the Moisture of the Dung. this our *English* Husbandmen understand well enough to put in Practice.

My Reader may perhaps wonder that we should be directed to lay but eighteen Cart Loads of Dung upon a *Roman* Acre of plain Ground, or in a Vale, and 24 Loads upon a Piece of Ground of the same Measure; especially, when he considers that a measur'd Acre upon the Side or Slope of an Hill, can produce little more than half the Quantity of any Herb, that an Acre upon the plain can do, as I have fully demonstrated in my monthly Writings: But the Case seems to be this, the Ground upon the Sides of Hills, by frequent Washing of the Rains, must of Necessity be much poorer than those upon a Flat; and then we must consider too, that by enriching the Hills, the Rains will from Time to Time, carry down to the Vallies the Richness of the Hills, so that in Effect what Manure we put upon the Hills, is only to enrich them for a short Space, and with an Expectation of receiving it again in the low Grounds with Interest.

Another Thing which we may observe in the *Roman* Husbandry, mention'd in this Chapter, is the Method they have of sprinkling of Pidgeons, or Goats, or Sheep's Dung among their Corn after 'tis come up, and they find their Ground is not rich enough to bring a good Crop; this carries a great deal of good Reason with it; and especially, since they leave the pluck'd up Weeds with it upon the Ground, it must certainly help extremely to the vigorous Growth of the Corn: But I may add by the by, that this Work must be done early in the Spring, before the Corn is too high, or the Weeds are got to Seed; for else, we should do more Harm than Good; we should break the Shanks of the Corn; and the Weeds, being once seeded, would soon furnish us with such a Crop, as would stifle the Corn: But as they are before they come to flower, they are full of vegetative Salts, which will greatly help

the Land when they once come to rot; this I have not yet known practis'd any where in *England*.

I cannot help observing with some Pleasure, the Method prescrib'd by *Columella's* Uncle, of improving one Soil by mixing it with another; for I have try'd it with good Success, in many Cases, but was not sensible, till I undertook this Survey of the ancient Husbandry, that the *Romans* had ever attempted any such Thing. And since I now have their Guarantee, I may perhaps find many of our *English* Husbandmen fall into it; but especially, those who are too proud to follow the Advice of any living Author.

But it may not be amiss, before I conclude this Chapter, to give my Reader some Account of the Plant call'd the Lupine, which is so much commended by the *Roman* Husbandmen. It is in *Parkinson's Theatrum Botanicum*, the *Lupinus Sativus Albus*, or the great white Lupine; it rises with a strong upright round, hollow, soft, and woolly Stalk, set confusedly with soft, woolly Leaves upon long Footstalks, each being divided into five, seven, or nine several Parts, narrow, long and soft, greenish on the upper Side, and whiter underneath; the main Stalk divides itself into two Parts, after the Flowers are grown from the uppermost Joint, and are like to the great Garden Bean, but wholly white without any Spot, the Branches flowering. after the first Flowers have given us slender, long, soft and woolly Cods, lesser than those of the Garden Bean, containing within them, four or five flat white Beans, somewhat yellowish within, and very bitter to the Taste; this Plant perisheth yearly. *Galen* tells us, that the Beans being steep'd some Days in Water, lose their Bitterness, and were eaten in his Time, when there was a Scarcity of Grain. There is one Thing which relates to the Lupine, which I cannot pass by unobserv'd, which is, that a Fumi-

Fumigation made by burning the Husks, drives away Gnatts, Flies and other Insects. I shall now conclude this Chapter, and proceed to give an Account of the *Roman* Method of laying down Corn Ground for Grass.



C H A P. V.

Of the Method used by the Roman Husbandmen, in laying down ploughed Lands for Grass, from Varro, Paladius, Columella, &c.

THE Difficulty of finding a Soil, which in every Respect, was fit for plowing and cultivating for Corn, as well as the extraordinary Care requir'd in the ordering of it, compar'd with the easy Culture, and Management of Pasture and Meadow Ground, might be the Reason, why the antient *Roman* Husbandmen chiefly bent their Minds to the breeding and feeding of Cattle, their *Pratum*, or Meadow, or Grass Field they so call'd, from *Paratum*, being always ready, and which requir'd little Labour.

M. *Porcius* observes, that the Meadow or Pasture Ground, is always safe from the Injury of Storms, which frequently annoy our Corn Grounds; the Grass Grounds, says he, cost but little to look after them, and every Year, bring a good Crop, both by Grazing and in Hay.

We may distinguish our Grass Grounds, by the dry and the wet, or the Upland and the Marsh.

A Fat Soil has no Need of a River to feed it, for in such a Soil, the Grass and Hay is much richer, and more nourishing, by growing naturally,

rally, than the Grafs which is forc'd by floating or watering. However, the watering of Grafs Lands, is sometimes unavoidable, if the Ground be poor.

There is this Convenience which attends the Husbandman, that would lay down Ground for Grafs; that whether the Soil be heavy or light, it will do for this Purpose, or if the Ground is esteem'd barren, we need not doubt the Success, if we can have the Command of Water; but we should however avoid choosng such Grounds as lye in Hollows, or decline too suddenly in sharp Slopes, because the first would hold the Water too long upon the Grafs, and the other would not hold it long enough to receive much Benefit from it; a Mean between one and the other, will turn best to our Advantage.

In our Choice of Land for Meadows, that Ground will do best, which has a gentle Fall from it, such as will not suffer great Rains, or the over Flux of Rivers to lye too long upon the Grafs; but is so situated, that the Waters which come upon it, may retire by gentle Degrees, for should they lye long upon the Ground, they would stagnate and spoil the Grafs: But if our Situation be such, that this happens, we must drain it by Trenches, for either too much, or too little Wet, is equally pernicious to Grafs Ground.

This Chapter informs us how well the Antients weigh'd every Affair they undertook, and how they reason'd over their Work before they set about it; if our *English* Husbandmen would take the same Method, I am perswaded, we should not have so many Complaints among them of ill Success; but how hard is it to break throw an old Custom?

There are two Things however that will admit of reasoning upon; the first is, what the Ancients say, concerning Grafs being more nourishing when
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it comes natural, than when it is forc'd by Waters; and the other is, what they observe, concerning the Situation of such Lands.

That Grass, or any other Herb, whose natural State of Growth is not in the Waters, will not be so nourishing when it is forc'd to grow by artificial watering, seems very rational; for every Plant of the Land, which is over-power'd with Water, gluts itself so much with watery Parts, that the Virtues of its natural Juices, are as it were drown'd in them; the Vessels of the Plant indeed are fill'd and seemingly are well nourish'd, but in drying of such Plants, we soon discover their Defect; for in the Exhalation, or Vapour which goes from them in the Time of their drying, the Abundance of watery Parts, which exhale from them, carry off a great Part of the natural Virtues of the Plants, and leave little more than a Body of empty Vessels, behind them, which can never nourish any Creature that feeds upon them, without they are fill'd with concocted Juices. This is the same in common Grass, as it is in other Plants; if it abounds too much in watery Parts, it dries to little or nothing, and affords little or no Nourishment to the Cattle that eat it; but when Plants are duly nourish'd, from such a gentle Share of Moisture, as gives only a necessary Refreshment to the Ground they grow in, then we may dry them to some Purpose, and they maintain their Virtue in drying: This ought especially to be regarded in the Choice of Hay, as well as any other dry'd Plant, that it had its Growth without the Contribution of excessive Waterings; for one Load of natural Hay, will be more heartening to the Cattle that feed upon it, than two or three Load, that has been forc'd by an Excess of Water.


The other Thing which I shall touch upon, is concerning the Situation of Ground to be laid down
for

for Grass, for upon that, in a great Measure our Success depends: The Observation of *Columella* is very just on that Head, where he tells us, that we should not chuse our Grass Lands in Hollows, where the Water will lodge, or upon such Grounds as fall too quick; well observing, that too much Water as well as too little, is alike injurious to Grass: In such Hollows as he speaks of, where the Water cannot run freely off, it will stagnate and rot the Roots of the Grass; and the Sides of Hills, which decline too suddenly, the Water, if we can let any upon them, will run off again, without penetrating deep enough into the Earth to nourish the Roots; or if the Ground be light, the quick Passage of the Water over such Grounds, will wash away the Earth from the Roots of the Grass, and leave them so expos'd to the Sun, that they will soon be burnt up. I shall now proceed to the *Roman* Method of managing Grass Grounds.



C H A P. VI.

Of the Roman Method of Treating of Grass Grounds from Columela, Varro, &c.

 HE Culture of Meadows, requires more Skill than Labour: We must take Care chiefly to destroy all Bushes, Brambles, Rushes, and tall Weeds that grow upon them: We must not suffer any Swine to enter upon these Grounds, for they rout up the Ground with their Snouts, and not only spoil a great deal of Grass, but make the Ground uneven; neither should we suffer large Cattle to come into our Meadows,

Meadows, but when they are very dry, because by the Impression, they would make with their Feet when the Ground is wet, the Roots of the Grass will be cut to Pieces.

The Grass Grounds on the Uplands, which are upon a poor Soil, should be dung'd in *February* (the Moon increasing) and all Stones, and such Things as are Enemies to the Sythe, must be pick'd up and carry'd away.

There are some old Meadows, which are overrun with Moss. This shows plainly a Defect in the Ground, and should be remedy'd, if possible, as soon as it begins to shew itself, which then may be done by sprinkling Ashes upon the Places, where the Moss appears: But if such Grounds have lain so long in this Condition, that the Ashes will not recover it, there is no other Way to be taken, than to break up the Meadow, and put it to some other Use; but a diligent Farmer, with a little timely Care, may easily prevent such an Evil.

On such Ground as this, after it has been plough'd, we commonly sow in Autumn, Rape, Turneps, or Beans, and the Year following, it will be fit to sow Corn upon.

The third Year, after we have clear'd it from Weeds, Brambles, and Bushes, we plough it carefully, and level the Mole-Hills; then we sow it with Vetches and Hay Seeds, breaking the Clods as fine as possible with weeding Forks, and harrowing them as even as we can.

We must observe, that we do not cut down the Vetches, till the Seed is full ripe, and ready to scatter, and then they must be presently bound in Trusses, and carry'd off the Ground. We may then water our Grass, if the Soil be stiff, or inclining to Clay, but in light Ground, we must not use this Benefit, till the Ground is well settl'd and fortify'd with Grass; for watering such light Land, before the Grass has taken a firm Root in it, would wash

wash away the best Part of the Surface, and leave the Roots of the Grass too much expos'd to the Sun. Neither must we suffer Cattle to come into such Crouds, till they are well settl'd; but let the Grass be cut as it grows, for the Cattle make so deep an Impression with their Feet in the unsettled Soil, and so bruise and wound the Roots of the Grass, that we lose a great Part of the Benefit we might expect.

When our Grass Grounds are once become firm, as in the second Year, we may first turn in our smaller Cattle, and the third Year the larger Cattle may be admitted.

Our higher Grass Grounds being generally of a poorer Soil than those in the Vallies, should be dung'd pretty often about the Ides of *February*, mixing Hay Seeds with the Dung, for the higher Parts nourish the lower, by Rains and Washing of the Waters which come upon them, and carries a great deal of the Richness from them into the Vallies; for which Reason, the Prudent Farmer will rather dung the Hills, than the lower Grounds.

In the dunging of Land, we must take Notice that upon hilly Ground, we must lay our Dung thicker than we need to do in plain Ground; and that in the dunging of Grass Land, we bring no more upon the Field at one Time, than can be spread in a Day; and we may take Notice likewise that if we dung Ground for Corn, the Rule holds still good, that the Hills have a greater Share of it than the Plains. The Heaps of Dung upon the Hills, may stand about six Foot assunder, each Heap containing about five Bushels; but upon a Level, the Heaps of Dung may be laid eight Foot assunder; and if the Weather be hot, the Dung should be immediately spread and plough'd in, for too much of the Sun's Heat will damage it, and make it lose a considerable Share of its Virtue.

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When our Meadows are strong enough in Grass for mowing, we must be careful, not to let our Grass stand too long before we cut it; that is, we must not let the Spike of the Grass be too dry, and we must take Care not to cut it while the Stalk is too green: As to the first, when the Spike or Stalk is too dry before we cut it, our Hay will afford very little Nourishment to the Cattle, having lost all its lively Parts, it is less profitable than Straw: And as to the second, if it be cut while the Stalk is too green, it rots in the Mow, and often takes Fire. A wise Farmer will always let his Hay, which has not had a good drying Time, or was cut while the Stalk was too green, lye loose a few Days before he build it into a great Mow; in Case of rainy Weather, when the Hay is cut, and is in the Field, we must put it in Cocks, of the Figure of a Pyramid, so that the Rain may run off from the Hay. This is the Sum of what the ancient *Romans* teach us, concerning Grass Grounds: As to the Practice in *England*, of what they prescribe to us, I think it is pretty general, unless it be in dunging the hilly Parts more than other Lands, and the sowing of Vetches with Grass Seed; as also the Way of putting Hay Seeds amongst the Dung that they manure their Grass Fields with, and their Method of curing mossy Ground with Ashes. I shall now proceed to make some Remarks. which may tend farther to the Improvement of Grass Grounds.

A very ingenious Farmer of my Acquaintance, when he laid down his plough'd Lands for Grass, after having level'd his Corn Ridges, sow'd Barley, with a convenient Share of Clover Seed and Rye Grass; the Consequence was, that he had first a good Crop of Barley, the same Summer, and in a Month's Time afterwards, a tollerable Crop of Clover to mow for Hay; and before Winter came on, there was again so large a Crop of the
Clover

Clover growing upon the Ground, that he fed Abundance of Sheep upon it, till the End of *January*: This Ground was situate upon the Side of an Hill, and its Parts were so bound together by the Roots of the Barley and the Clover, that the Cattle did the Ground no Injury. The second Summer, he cut three Crops of Clover and Grass together, and the Land continu'd in an extraordinary State for two Years afterwards, and may still, for ought I know, be in good Condition.

We are to understand, that when Meadows or other Grass Lands grow mossy, that it proceeds either from the Poverty of the Ground, or else, that Water has lain too long upon it, and grown stagnant, or that some Springs lye too near the Roots of the Grass. If it proceeds from the Poverty of the Ground, it is the Farmer's Fault, that he has not given his Ground a necessary Share of Dung, and that is such a Fault as is very hard to redress; for if we think to amend the Error by laying on a great Coat of Dung at once, we shall rather destroy our Grass quite, than recover it; the dunging such Land should be moderate, a little at a Time, and at least one half of the Manure we lay upon our Grass, should be fine Earth, which upon the first Shower of Rain, will settle to the Roots of the Grass, and cover the Moss, so as to destroy it; but especially, if upon the most mossy Places, we mix our Dung with Sea Coal Ashes, which will do much better than Wood Ashes; we should observe, that when we dung our Grass Grounds, it should be done in very dry Weather, that the Earth which we mix with the Dung, may fall freely amongst the Grass; and besides, that the bringing the Carriages of Dung upon the Field, may not cut into the Turf. If our Soil is light, then we should provide a stiffer Sort of Earth to mix with the Dung, and the lighter the Soil of our Field is, so much more


more must the Earth be in Proportion, that I prescribe to be mix'd with the Dung; but if the Soil of the Field be stiff, then we may have two thirds of Dung to one of Earth, for our Compost.

The next Thing to be consider'd, concerning Grass Grounds growing mosley, regards the Waters standing upon such Grounds till they grow stagnant; the Fault here is, in the first laying down the Ground for Grass, the Farmer has not then been careful to lay his Ground level, or disposing it in such a Manner, that the Waters might all run off. The ancient Writers, very wisely give us their Advice, concerning this first Step to be taken in the laying down of Ground for Grass, and that we must not leave any Hollows in such a Field; but when this Advice has been neglected, the surest Way that I know of, is to make Trenches from such Places, to draw off the Water; but if we have not Fall enough to do that, than we must have immediate Recourse to the last Remedy, which is ploughing up the Ground, and sowing Turneps or Rape upon it, to fit the Ground for Corn; for these, not only mellow the Ground, but enrich it, while at the same Time, the Turf has Time to rot.

But if neither of these be the Case, and the Occasion of our Grounds becoming mosley, happens to be from some Spring that lies too near the Surface, we may despair of ever making such Land fit for Grass; but it must be turn'd to some other Use, as we shall find in the following Pages.

C H A P. VII.

*Of the several Sorts of Bread-Corn used
by the Ancients, from Cato, Varro, Pliny,
Columella, &c.*

 COLUMELLA tells us, there are several Sorts of Corn, the best of which is the *Robus*, or red Wheat, which is heavier and brighter than any of the rest : The second is the *Seligo*, or Winter Wheat, which makes the finest Bread ; but is not near so heavy as the former. The third Sort is call'd *Setaneum*, (i. e.) *March* or Summer Wheat, which is fit to reap in three Months after Sowing ; it is of great Service to the Husbandman, for when he has not had a favourable Opportunity of sowing a winter Crop of Wheat, he may have some Amends by a Crop of this Kind sown in *March*. There are yet some other Sorts which are not worth mentioning, altho' there are four Sorts of *Adoreum* in Use, viz. the *Far Clusinum* very white, the *Far Vernaculum rutilum*, the *Far Vernaculum candidum*, which are both of them heavier than the *Clusinum*, and another which is call'd the *Halicastrum* or *Alicastrum*, and is the best of them all for Weight and Goodness.

An industrious Farmer should have all these Sorts by him, that he may the better suit every Kind of Soil and Situation about his Farm, with a Grain proper for it. The first Kinds of Wheat, mention'd in this Chapter, love a dry Soil, and a moist one does no hurt to the *Adoreum*. Thus far the Ancients of Bread-Corn ; I shall now proceed to explain what each Sort is, and give my Reader an Account of their several Uses among the Romans, &c. I shall

I shall begin with the *Robus* of *Columella*, which I take to be the *Triticum aristis munitum*, i. e. the bearded or red Wheat of *Parkinson*; the *Triticum* of the *Latins* is the same with the *πυρρός* of the *Greeks*, says *Varro*, that is a general Name which we render Wheat. as we do also the Greek *σίτη*, which is *Vescendo dictum quod frumentum* from *fruendo*, *culmus extulit*, says *Varro*. *Parkinson* I find is of my Opinion, that the *Triticum aristis munitum* is the *Robus* of the Ancients, à *rubore grani*, that is from the Redness of its Grains, tho' some suppose the *Robus* to be what they call *Triticum*, or *Aristis carens*, that is, unbearded Wheat, or that Sort which *Parkinson* names *Triticum spica mutica*, or bare or naked white Wheat, which does not at all answer to the *Robus*.

The *Siligo* of the Ancients is another Sort of Wheat, which *Lobel* makes to be the *Triticum spica mutica* of *Parkinson*, only altering *Triticum* into *Siligo*; and there is some Reason to suppose that he is in the right as this Sort of Wheat seems to answer the Character given of the *Siligo* by some of the Ancients: however, *Gaza* supposes the *Ὠλύρα* of the *Greeks*, which is also call'd *Olyra* in *Latin*, to be the true *Siligo*, which, he tells us, *Pliny* says made the sweetest Bread; yet *Pliny* does not particularly tell us, that the *Olyra* and the *Siligo* are the same, altho' *Hermolaus*, *Budæus* and *Ruellius* seem to believe it; for *Lugdunensis* informs us, he can find no such Thing in *Pliny*. Thus we have the several Sentiments of the Comentators upon the Ancient Writers of Husbandry, concerning the *Siligo*; but I think none comes so near the Point as *Lobel*; for *Mattheolus* tells us, that he did not know of any of the *Olyra* growing in *Italy* in his Time, which undoubtedly would have been found somewhere in that Country, if it was the true *Siligo*, so well known to the *Romans*; but the *Triticum spica mutica* of *Parkinson*, which *Lobel* supposes

to be the *Siligo*, is to be found at this Day in several Places in *Italy*; both this and the former are plentiful enough in *England*.

The *Setaneum* is undoubtedly the *Triticum trimestrum*, or Summer Wheat of *Parkinson*, which the Ancients tell us they sow'd in *March* and reap'd in three Months: The Grain, tho' it is none of the largest, yet affords a fine Flower or Meal. This is the same Sort I have already mentioned, in my Remarks upon one of the foregoing Chapters, to have been sent me from the North Side of the *Apenine* Mountains, and would stand some of our Farmers in good stead, where their Ground is naturally too Cold to hold a Winter Crop of Corn; three of our most favourable Months will do for this: And what I was inform'd by the Gentleman who sent me the Present of this Corn, still makes it more valuable, which is, that the People who cultivate it upon the *Apenines*, do not use any Manure to their Ground, and yet it brings a good Crop. I wish some of the Gentlemen in *England*, who I gave of this Corn to, would acquaint me what Success they had with it.

Having now determin'd, as far as my Judgment and Observation will allow, the three Sorts of Wheat principally mention'd by the ancient Writers, viz. the *Robus*, *Siligo*, and the *Setaneum*, I proceed to describe what the Ancients meant by *Far*.

The Word *Far* is differently understood and apply'd by the ancient Writers, some of them taking it for a Kind of Spelt Wheat or *Zea*; and *Pliny* in *Lib. 18. Cap. 8.* says, *Vulgatissima Far quod Adoreum Veteres appellavere, Siligo, Triticum, hæc plurimis terris Communia*: And in the 10th Chapter of the same Book, he tells us, *Ex Arinca dulcissimus panis, ipsa spissior quam Far & majore Spica, eadem & penderosior*. But again, some are of Opinion, that it means any Kind of Grain; but it is much more likely, that

that it signifies the Pultages made of the several Grains, as *Columella* seems to intimate when he mentions *Far Adoreum*, *Far Triticum*, *Far Hordeaceum*; and *Pliny* likewise gives us to understand as much when he says, *ex Olyra in Ægypto Far conficitur*, that they make *Far* in Egypt of the *Olyra*, which is the soft Wheat of *Parkinson*. It is also taken for the fine Meal of that Wheat which is call'd *Far*, or *Adoreum*. *Dionisius Halicarnassens* tells us, that the Ancient Romans call'd their Marriages *φαρραία*, because the married Couple were oblig'd to eat *Far* together: Some of our Commentators upon the Ancients, supposed *Far* to be the same with *Alica*, because they imagined that both their Preparations were alike; but we shall convince them of that Error, by giving them some Account of the Methods used in the preparing of each of them.

Archigenes in *Oëtius* gives us an Account of the Manner of preparing this *Far*. The Wheat, says he, is steeped a while in Water, and being taken from thence, is put into a Mortar, to be cleansed from the Husks, and afterwards laid in the Sun and rub'd with the Hands, till it is entirely clean, and clear of Chaff: When this is done, let it be broken a little grossly, so that each Grain may be divided into four or five Pieces, and being dry'd is kept for Use after the Manner of *Alica*, which is boyl'd; some also recommend the green Ears of Wheat, of which they make a more pleasant Meat than the other. This Pultage, says *Parkinson*, very much resembles our boyl'd Wheat, which Country People bring to the London Markets, by the Name of Dish-Wheat and Bowl-Wheat.

Far among the *Latins* was also call'd *Ador* and *Adoreum*, and *Semen Adoreum*; 'twas certainly a fine Kind of Wheat, and to be used only for eating, either in Bread or Pultage, and was not, as I can find, ever made use of for Drink, as Barly is,

which *Columella* and the rest recommend among the Pulse. Their best of Grains likely had the general Name given them of *Adoreum*, because the Ancients used the Cakes made of them at their Sacrifices ; but as there might be some small Difference between one Kind and the other, or that the Management of one Sort in different Places might render one more luxuriant than the other, so they distinguish'd the Grain they gather'd from different Spots by some particular Name, as the *Far Clusium* might be cultivated near the City *Clusium*, now *Chiusi*, in the Middle of *Tuscany*, and the *Far Vernaculum Rutilum*, & *Far Vernaculum Candidum*, were Distinctions for their red and white superfine Home-Wheats, as their *Halicastrum*, or *Alicastrum* from *Alica*, *ab Alendo*, from its singular nourishing Quality : But I shall proceed to lay down the Uses which the Ancients made of their Grains.

We have many different Accounts of the *Crimmon* ; *Galen* tells us, the Ancients made it of Wheat, as the *Alica* or *Chondrus* was made of *Zea*, which Sort of Grain I shall mention by and by ; then he tells us, that the *Crimmon* of the *Greeks*, and the *Simila* or *Similago* of the *Latins*, is the coarser Meal of the husked Grain call'd *Far*, whereof they made their Pultage.

Dioscorides informs us, that *Crimmon* is the coarser Meal of *Zea*, and of White Wheat, and also of *Olyra* : He tells us it is very nourishing, but is hard of Digestion ; it bindeth very powerfully, especially if the *Zea* whereof they make it, is first parched ; but whether it was made of Wheat, or of the *Zea*, or of a Mixture of Corns, we may judge better when we have gone through the several Pultages made by the Ancients ; in the mean Time I shall set down what the *Zea* is.

Zea, as in the *Latin* so in the *Greek*, ζέα, or ζεία, which *Gaza* translates *Semen*, taking it perhaps
from

from Pliny, who before his Time told us, that *Zea* was *Far* or *Adoreum*, and also *Semen*, as the most singular Corn of any other. Parkinson's *Zea*, *Theophrasti* & *Antiquorum*, or Greek Wheat, or *Zea* of the Ancients, seems to be the Plant we enquire after: He says, it riseth up with many strong jointed high Stalks, and Leaves on them, most like unto Wheat; the Ear is plentiful in Corns, as *Theophrastus* saith (bare without Beards, as *Lobel* and some others have thought; yet *Lugdunensis* setteth it forth, if his be the true *Zea*, with Beards, but *Theophrastus* makes no mention of Beards) he only says, the Grains of the True *Zea* are enclosed in many chaffey Husks, and are the lightest of those which are of the husked Sort of Wheat; and he tells us also, that it is very agreeable to all Creatures; the Roots are many, and take good hold of the Ground, from whence they draw a large Share of Nourishment; this loves a rich Soil, and yet will soon render it infertile. This Account of *Theophrastus* and of the Ancients, *Zea* seems to be truest of any other; 'tis taken from his History of Plants, *Lib. 8. Cap. 9.* The *Zea* of *Lugdunensis*, which is the *Spelta* of *Matthiolus*, bears naked Corn, which is bearded, and no Way answers the Account we have of the Ancient *Zea*; neither does the *Zea spica mutica* of *Camerarius*, or the *Zea spica mutica* of *Tragus* agree with the Description of the True *Zea*, as they have not strong nor tall Stalks, or many of them growing together, from such a bushy Root as *Theophrastus* mentions, unless it be degenerated: For *Theophrastus*, *Lib. 8. Cap. 8.* tells us, that no Corn is so apt to degenerate or loose itself as the *Tipha* and *Zea*; but I suppose, if he had treated other Sorts of Grain as his *Zea* had been treated, he would have found the same Effect from the same Cause, *i. e.* the sowing of the same Corn upon the same Ground continually, will cause such Corn to degenerate, even

at last so much, as to produce nothing but barren Ears, as I have experienced; or if Wheat or other Sorts of Corn are mix'd in the Field, why may not the *farina fecundans* of one Sort Impregnate the Corn of another Sort, and bring a cross Strain, as we find it will do in Fruits and Flowers, according to my System of the Generation of Plants. There is one Sort of *Zea* which is call'd the *Zea dicoceos*, *sive spelta vulgo*; which some have thought was the *Zea* of *Theophrastus* and *Galen*, but seems rather the *Zea* of *Dioscorides*: This perhaps might be of that Tribe of Corn which the old Romans call'd *Ador*, as some have hinted, or the *Semen Adoreum* of the later Romans, and is now call'd *Spelta*. But I shall conclude these Remarks upon the *Zea* with my Opinion, that it is a close husked Wheat, and that the *Zea* and every other Sort of Corn will degenerate, if it be cultivated a few Years upon the same Ground.

The *χορδης* of the Greeks, seemeth to take the Name *quasi Granum*, for the Excellency, and *Alica* of the Latines from *Alendo*, tho' *Ægineta* makes *Chondrus* and *Alica* to be two several Sorts, but is contradicted by all Latin Writers. *Galen primo Alimentorum* tells us, *Alica* is a Sort of Wheat: And *Ægineta* says, *Chondrus* is somewhat like Wheat, but more glutinous, and was esteem'd the most excellent Meat or Pultage that was us'd by the Ancients. *Dioscorides* says, *Halica* or *Alica* was made of the *Zea* call'd *Dicoceos*. While *Galen*, *Ægineta*, and *Oëtius* tell us in their Works, that it was made of Wheat, and other Sorts of Corn; but I believe there is no Doubt but this *Alica* was made of *Columella's Alicastum*, which is one of the *Adors*, or husk'd Wheats, which he very much commends, and may perhaps be what some call *Zea*, which as we have shewn above, is a husk'd Wheat. *Pliny* tells us, that *Far* and *Halica* are different Sorts of Meat, *Lib. 18. Cap. 8. Aliud esse*

esse Zeam e que fit Alica aliud vero Far ; and in the Chapter before, he says, the old Romans liv'd only on *Far* made of Wheat, for 300 Years, and in *Lib. 22. Cap 25.* he tells us, that *Halica* was a Meat lately known, and as he thought was not in Use before the Time of *Pompeius Magnus* ; the Manner of making it, he gives us, in *Lib. 18. Cap. 11.* *Alica*, says he, is made of *Zea*, first steep'd in Water, and then beaten in a wooden Mortar to get of the Hulk, for a Stone Mortar would bruise the Grain too much ; when the Corn is quite clean from the Hulk, they again beat it in the same Manner, that the naked Grain may be broken : Of this, they make three Sorts of Meal, the smallest, the second, and the largest ; and then, says he, they add Chalk to this Meal, to give it that commendable Whiteness, so much admir'd by the Eaters of it. Our Translators of *Pliny*, tell us, that after all this, they would add a forth Part of *Gypsum*, which signifies a white Morter ; but in my Opinion, it is much more to the Purpose, if we translate that Passage thus. To this Meal they added about a fourth Part of Chalk, and made the whole into a kind of white Morter, to be kept for Use. *Galen*, however, observes that their *Alica* was very well wash'd, before it was put into their Broaths ; but I cannot see, that they design'd any more by such Washing of their *Halica*, than to clean it from the Dust or Dirt, which it might contract while it lay by ; for to put Morter to this, must certainly render it very unwholesome, and make it in every Respect unfit for the Stomach ; but if it was so, that they should put any Thing to it, which was to be wash'd out again, before they us'd it, I think that was taking Pains to no Purpose ; and for the Chalk which they might put into the Meal to give it a bright Colour ; every one knows it is not only grateful to the Stomach, but is also helpful to the Body in

many Cafes ; and why they ſhould attempt to waſh it out of their *Halica*, when they had once taken the Pains to put it in, would have been attempting an Impoſſibility. *Dioſcorides*, *Galen*, and *Pliny* highly commend the nourishing Quality of the *Halica*, whether it be waſh'd with Mead, or boil'd in Broths or Pottage, which *Galen* calls *Chondroptifana*, it is exceeding profitable. Thus far of the *Chondrus* ; we ſhall in the next Place ſpeak of the *Atbera* of the Ancients, which is another Pultage of the *Romans* : This ſays *Dioſcorides*, is made of *Zea*, finely ground, and then prepar'd like a Liquid Papp, and given to Infants ; but ſome Authors affirm it was made of the Wheat *Olyra*, or *Amylum* ; but I ſuppoſe any fine Wheat Flower would do.

But it yet remains, that I give ſome Account of the *Amylum*, and of the *Tragus*, which are other Pultages, which were in Uſe among the *Romans*.

The *Amylum* was made of the Summer Wheat, according to *Dioſcorides*, which is the ſame with *Columella's* *Setaneum*, and alſo was made of *Zea*, ſteep'd three Days and Nights, till it was ſoft and tender, at which Time the Water ſhould be pour'd from it, and other freſh Water put to it ; and then trodden with the Feet till all the finer Parts paſs through a Sieve ; which then muſt be dry'd in the Sun, as carefully as poſſible, till there is not the leaſt Moisture left in it, and then muſt be kept dry for Uſe.

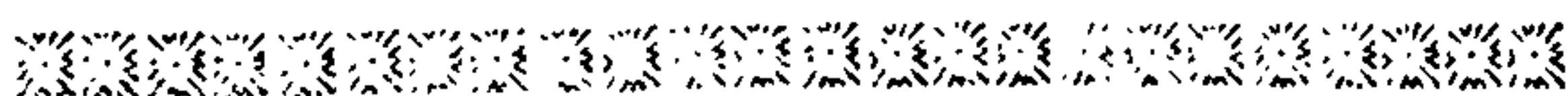
Cato tell us, that this is likewise made of the *Siligo*, and *Pliny* ſays of all Sorts of Wheat, as well as of *Siligo*. But that the beſt is made of Summer Wheat, or *Setaneum* ; they call it *Amylum*, ſays *Pliny*, becauſe it was made without a Mill, the Greek *ἀμυλον* ſignifying *quod ſine mola fiat*.

The *Tragus* of the Ancients, as well as the foregoing Pultages and Corns, has been very much confounded by ſeveral Writers, ſome taking it for
a kind

a kind of Grain by itself, call'd the *Triticum Lucidum*, because *Dioscorides* seem'd to say it was not unlike the *Alica*, which they took to be a Grain; but we have already said enough of the *Alica*, to shew that it is not any Sort of Grain, but a Pul-tage made of a Grain. *Galen* in his Book *primo Aliment*: signifies, that *Tragus* is a Thing made of the *Olyra*, somewhat like *Alica*. When this *Olyra*, which ought to be of the very best, says he, is husk'd as it ought to be; it must be boil'd in Water, and the Water being drain'd from it, pour to it either Wine or Water, sweeten'd with Honey, to which we are to add some of the Kernels of the Pine-Tree, after they have been soften'd by steeping in Water; 'tis likely the Sort of Pine Kernels, which is here mention'd, are those which are now call'd by the *Italians* *Pinochi*, and are much us'd by them to eat, as we do Almonds. I the rather believe those which are mention'd by the Ancients, are the same I speak off, because all the other Kinds have their Kernels too much abounding with Turpentine, to be pleasing to the Palate; and besides, in all my Travels, I have not heard, that any have been us'd as these are; which in my Opinion are much more agreeable to the Taste than Almonds.


Cassianus Bassianus in *Geoponicis*, *Lib. 3. Cap. 13.* says, that the *Tragus* was made of the Wheat of *Alexandria*, which most Authors agree, was the *Olyra*, steep'd and husk'd, and dry'd in the Sun often, till it was clear of the Husks. One may observe, from these Accounts, that most of the Sorts of Corn, of which the Ancients made their Pul-tages, were husk'd Wheats; and I imagine that the several Uses they were put too in several Countries, was the Occasion of their several Names, which have so much confounded those who have written about them. But I shall now proceed to enquire

enquire into the several Sorts of Pulse, which were cultivated by the *Roman* Husbandmen.



C H A P. VIII.

Of the several Sorts of Pulse and other Seed, as Pease, Beans, &c. cultivated by the Ancients ; with an Account of the several Uses they were put too by the Romans ; from Columella, Varro, Cato, &c.

olumella gives a Chapter particularly upon this Head, or rather, I may say, a Catalogue of such Pulse and other Seeds, as were cultivated in his Time by the *Roman* Husbandmen. He says, the Seeds and Pulse, which are reckon'd the most useful, are Beans, Pease, Lentills, Phaselus, Vetches, Hemp, Millet, Panick, Sefamum, or the oily purging Pulse, Lupines, Flax, and Barley, because Ptisane is made of it.

The best for Fodder, are the Medica, Fenugreek, and Tares, and the next to those are Vetches, the *Orobus* or *Ervum*, and the *Farrago*, which is green Barly. Thus far *Columella* of the Pulse and Grains, us'd by the Ancients ; which I shall consider one by one, that my Reader may not mistake in his Culture of any of the Sorts here set down.

'Tis none of the least Difficulties in the modernizing this Work of *Columella*, and the other *Scriptores de re rustica*, to be exact in the Description of those Plants and Herbs, which they recommend to us : In the foregoing Chapter, we
have

have an Instance of it in the different Accounts of Corn, even given us by the best Botanists among the Ancients; and some of the Commentators upon them, have made the Way to this Knowledge still more difficult, by confounding one Thing with another: 'Tis for this Reason, I am forc'd to spend more Time in my Accounts of these Things, than I at first thought to do, in giving the Sense of the principal Writers on these Heads, as well as my own Opinion. But I suppose it may not be disagreeable to my Readers, to find such a Work as this is, set in the clearest Light, tho' it may render it somewhat more voluminous.

Of the Roman Bean.

Of the Pulse mention'd by *Columella*, the Bean is what I shall first examine. The *Faba Sylvestris Græcorum*, sive *Faba Veterum* of *Parkinson*, seems to be what was in Use among the ancient Romans; for we find that the Romans, in Husbandry as well as in other Arts and Sciences, follow'd the Greeks as near as possible, and particularly in the Culture of their Fruits; so undoubtedly the Beans, Pease, &c. which the Romans rais'd upon their Farms, were generally the same as were cultivated among the Greeks who had Opportunities of collecting from all Countries which border'd upon the *Mediterranean* Sea. This Bean is call'd in Greek *Κλάυς ἀγρία* and *Faba Sylvestris*, by the *Latins* it is also call'd *Faba Græca*, to distinguish it from the *Faba Ægyptia*. Authors have been very various in their Opinions, concerning the *Faba Veterum*, or *Antiquorum Græcorum*; some of them making it the same with our *English* Garden Bean, but without any Reason as I can find; for the Ancients compar'd the Seed of their Bean, to that of the *Lotus* and *Terebinthus*, which by no Means agrees with our Garden Bean, but comes near to the Seed of the *Faba Sylvestris Græcorum*;

Gracorum; *Lobel* and *Lugdunensis* are on my Side, and have sufficiently shewn the Mistakes of those who would endeavour to perswade us, that the Bean us'd by the Ancients, was our common Carden Bean. *Lobel* calls this, *Faba Gracorum Sylvestris*; which *Dodoneus* names *Bana sine Faselus Sylvestris* and *Bana Nigra*, i.e. black Bean, *Camerarius* calls it *Pisa Nigra*, or black Pea, and *Lugdunensis* *Phasolus Sylvestris*; this Sort grows naturally in Spain, says *Parkinson*, from whence he tells us, he receiv'd the Seeds. *Dodoneus* has given us a good cut of this Sort of Bean; which without Doubt is the same Sort of Bean mention'd by *Dioscorides* and *Galen* in their Medicinal Prescriptions, altho' we use our common Bean Flower in the lieu of it to good Effect, yet theirs would certainly be the most proper.

It is a Thing well worthy our Remark, in what Veneration the Ancients held this Study of Agriculture; how many of their great Families have taken their Names from Beans and Pease, which very likely might first come from their Ancestors, who were Husbandmen, and rais'd themselves by cultivating of such Kinds of Pulse, as *Fabius Porcius*, *Quintus*, *Fabius maximus*, *Piso*, *Cicero*, &c. besides, the Use of Counting and Numbering with Beans which is still practis'd in some Parts of Italy, and the Way of balotting, us'd among the ancient Romans upon Elections, with black and white Beans.

But while I have the Roman Bean before me, I cannot help mentioning another Sort of Bean, as it was call'd by the Antients, which grew in Ægypt, which *Dioscorides* and *Theophrastus*, calls *Faba Ægyptia cujus radix Colocasia dicebatur*, that is the Ægyptian Bean, whose Root was call'd *Colocasia*; but there is a very wide Difference between this Plant, and what bears the Name of Bean in our Fields and Gardens, not any Part of the Plant of
the

the *Ægyptian* Kind, bearing the least Resemblance with what we call Beans now a Days, as by the Description will appear : However, since it was known to the *Greeks*, and us'd with them as Beans; so it might also be known to the *Romans*, perhaps, tho' not so much us'd by them as the true Bean which I have mention'd above : The Bean of *Ægypt*, says *Dioscorides*. is call'd by some the Bean of *Pontus* ; but *Theophrastus* mentions neither *Ægypt* nor *Pontus*, but only names it a Bean growing in Lakes, and standing Waters in *Asia*, that are in *Syria* and *Cilicia* ; but in these Places, *Theophrastus* tells us, it does not ripen its Fruit ; but about *Torona*, in a Lake in the Country of *Calcidicum*, the Fruit comes to full Perfection. *Dioscorides* tells us, this Plant brings large Leaves, like those of the *Petasites* or Butter Burr ; the Stalk, says *Dioscorides*, is a Cubit long, which is a Foot and half, and *Theophrastus* says, the longest Stalk is four Cubits, which is six Foot, and of the Bigness of one's Finger, like a soft Reed ; but without Joynts : Whoever is unacquainted with the Manner of Growth, common with Water Plants, may wonder at the Disproportion in the Length of the Stalks, set down by these two Authors ; but a little Enquiry will soon reconcile it to us ; the Water Lillies, for Example, will sometimes have Stalks to their Leaves, of four or five Foot long, and sometimes not above half a Foot, which depends only upon the Depth of Water they grow in ; the white Water Lilly I have gather'd in Water five Foot deep, and the Leaves of the Plants have then laid flat upon the Surface of the Water ; and the Roots which I took from thence, and planted in Tubs of Water, made their Leaf stalks or Footstalks, the Year following, hardly six Inches long, which was, because they had no greater Depth of Water to grow in : And this I suppose was the Occasion of the Difference between the Length of the Stalks mention'd by

Theophrastus

Theophrastus and *Dioscorides*; this Plant, say they, bears a Flower twice as large as the Poppy, with double Flowers, as one may interpret the Words of *Theophrastus*, *plenum Caput*, of a Rose Colour; after which appeareth the Fruit call'd *Ciborion*, i. e. a small Cask, not unlike the Comb which is made by Wasps, in which is contain'd about thirty Cells, and in every Cell groweth a Bean or Seed, whose Top rises above the Cell that encloses it. *Clusius* in his Account of this strange Fruit, tells us, the Fruit is much like a Poppy Head, cut off at the Top of a light brown Colour; the Circumference at the Top, was about nine Inches, and growing less and less towards the Stalk; the upper Part of the Fruit was smooth and plain, having 24 Cells, plac'd in a certain Order; in every one of which, was a small Nut, like an Acorn, almost an Inch long, and an Inch in Compass, whose Top was brown, ending in a Point like an Acorn; this Nut or Bean, they tell us, is a little astringent, and somewhat bitterish to the Taste. This Account of *Clusius*, agreeing so well with the other Accounts of the Ancients, may well enough determine that it is the true *Faba Ægyptia*, which was so well known among the Greeks. For my Part, I am apt to guess it is rather a *Nymphaea* or Water Lilly, than a *Colocasia*: And I think the Method of propagating it, as *Athenus* tells us, must not be omitted; which is to put the Seeds of it in Clay, and so thrust it to the Bottom of the Lake or Pool, where we design it to grow. This Method is very proper to be us'd, where we design to propagate any of our Water Lillies from Seed.

Of Pease.

I should now speak particularly of the Pease, which were cultivated by the *Roman* Husbandmen; but

but I find but small Footsteps to that Discovery. *Dodoneus* tells us, that his *Pisum majus*, is call'd in the *Flemish* Language *Roomſhe erwiten* and *groote erwiten* which in *Latin* is *Pisum Romanum* aut *Majus*, which is the *Roman* Pea or greater Pea, and the *Lathyrus major pereunis*, or greater Everlasting Pea is call'd by *Tragus* *Pisum Græcorum*, but the *Greeks* make a Difference between $\Lambda\alpha\theta\iota\gamma\epsilon$ and $\pi\iota\sigma\sigma\alpha$; however, the Grains of the *Lathyrus* were eaten by the *Greeks*, as well as Pease; for *Galen* tells us, that the Country People in *Asia*, where he liv'd, us'd the *Lathyrus*, not only as they in *Alexandria*, and other Cities did their *Phaseola* and *Ervilia*, but made them into a Pultage, as they did *Lentils*; but he adds that the Pultage made of the *Lathyrus*, is of a thicker Consistence than the others; and therefore is more nourishing.

But besides, what *Galen* mentions of the Use of this *Lathyrus*, it would be of singular Benefit, for Cattle who will eat the green Haulm of it very greedily, as I am inform'd by — *Tempest*, Esq; F. R. S. and has this Advantage more than other Fodder, that it may be cut 3 or 4 Times in a Year. This is very easily rais'd of Seed sown early in the Spring, but must stand till the third Year, before we must expect it to flower with us, tho' perhaps it might come to bloom sooner in a hotter Country, because the Juicies would be sooner digested and divested of the watry Parts, in such Places where the Heats are violent, than in our moderate Climate.

Of the Lens or Lentil.

But I now come to describe the *Lentil* and give an Account of its Use among the *Romans*.

Of the *Lentil* we have two Sorts cultivated in *England*, that which is called the *Lens major*, and the other the *Lens minor*; that is, the greater *Lentil*

til, and the smaller Sort; the larger Sort consists of several slender weak Branches, somewhat hard, about two Foot long, from whence shoot forth at several Places long Stalks of small winged Leaves, set on each Side of a Middle Rib, without any odd Leaf at the Point, for the Leaf-Rib ends in a small Clasper: The Flowers are small, and rise from between the Leaves and the Stalks, in Couples, at the End of a long slender Foot-stalk, of a reddish purple Colour, somewhat like those of Vetches; after which come small short Cods, which are somewhat flat, in which are contain'd two or three flat round Seeds of a pale yellowish Colour; the Root is fibrous, and dies yearly.

The *Lens minor*, or smaller *Lentil*, differs from the other, in having its Stalk, Leaves, and Seed smaller; the Flowers are more pale, and the Seed is whiter, which makes the whole Difference. The *Lentil* is call'd in *Greek* φακὶς and φακὴ and in *Latin* *Lens* and *Lenticula*; the Country People in *Hampshire*, *Wiltshire*, and the Countries thereabouts, call them Tills, and cultivate them only as Fodder for their Cattle: The ancient *Greeks* and *Romans* us'd the Grains of them in their Broths; and also, as some say, made Pultages of them: But *Galen* says, this Food is apt to breed melancholy Humours; and therefore is by no Means proper for those that are of dry Constitutions, but 'tis profitably given to those that are of a watry Disposition.

Of the Phaselus or Faselus, or Phasiolus and Phaseolus.

I find many Controversies have been among the Botanick Writers, concerning the *Phaselus* of the Ancients, some being willing to make it the *Phaseolus* or Kidney-Bean, while others make it a very different Sort of Plant. *Virgil* in his first Book
of

Georgics, seems to make it no great Compliment, as some think when he says,

Sen Pinguem Viciam series, vilemve Phaselum.

And which they fancy declares the *Phaselus* to be a wild Pulse, which Character does not well agree with the Sorts of Kidney Beans we cultivate in *England*; unless the *Romans* happen'd to have of the very worst Sort, which indeed might be of the smallest Kinds, and might make but an indifferent Meat; and especially if the Seeds of them were dry, before they were prepar'd for eating; which I suppose was the Way the *Romans* us'd them, and not to eat the Cods of them green as we do in *England*; for we find nothing of that mention'd by any of them; and besides, 'tis not every Sort neither that has the Shells or Cases of the Seed fit to eat; and some of the smaller Sorts especially have their Shells so full of Strings, that they cannot be eaten, and their Seeds are so small, that they are scarce worth taking out of the Shells; and truly, if they were such, I cannot think they deserv'd any great Share of Labour. I have seen about 50 Sorts of Kidney-Beans, from divers Parts of the World, some whose Seeds have been as large as Walnuts, and others, whose Seeds have been no larger than Tares; and there are some yet less, as is the 13 mention'd by *Clusius*, with black Seeds; and perhaps some of these smaller Kinds, were those that the *Romans* cultivated; if *Phaselus* and *Phaseolus* prove to be one and the same Thing; let us now see what the Writers of Plants have said of it.

The *φασεολίς* of *Dioscorides* is written by *Galen* *ασηολίς* and has been the Occasion of some Controversy, concerning which *Matthiolus* writ against *Manardus*, who thought the *Phaseolus* of *Dioscorides* to be the *Ervilia*, and the *σμίλαξ κηπαία* i. e. *Smilax hortensis*

bortensis quod Smilacis modo conscendit, to be the ordinary *Phasiolus*; which Opinion *Matthiolus* contradicts, and joyns with *Cordus*, that the common white Kidney-Bean was the *Phasiolus* of *Dioscorides*; but that cannot be the Meaning of *Dioscorides*, because he places his *Phasiolus* among the ordinary Pulses which grow wild; and tells us, that it is hard of Digestion, and moves Vomiting, which we do not find from our Kinds, but is common to many wild Pulses; he tells us, likewise, that the Seeds of his *Phasiolus*, are like those of the *Spartium Frutex*, or Spanish Broom. Again, some likewise make a Doubt, whether the *Dolichus* of *Theophrastus*, and the *Smilax Hortensis* of *Dioscorides* are the same. But *Galen* in *primo Alimentorum* has pretty well set that to rights, where he says, that because *Theophrastus* tells us, his *Dolichus* must have long Poles to support it in its Growth; he surely means the *Phasiolus*, or *Dioscorides Smilax Hortensis*. So that it appears that the *Dolichus*, *Smilax Hortensis*, and our common *Phaseolus* are all one, which *OEtius* tells us in his first Book: For without Doubt the *Phaseolus* of *Dioscorides* is the same with the *Phaselus* of *Galen*, which he joyns with *Ochrus*, speaking of *Phaseolus* afterward, and *Lobell* takes to be that Pulse which *Lugdunensis* calls *Phaseolus Sylvarum*, and *Clusius* the *Orobis Pannonicus*. *Cordus* makes *Phaselus* and *Phasiolus* to be but one, and differing from *Phaseolus*, which rises pretty high, and must be supported with Poles; but the *Phaselus* does not rise: so far the various Opinions of the Writers of Plants; from whence I conclude, that the *Phaselus* of the Romans was a Dwarf Kidney-Bean, which never clamber'd, as *Phaseolus* was the Name given to such Kidney-Beans as would run up Poles; for we have several Sorts of Kidney-Beans, which are Dwarfs, and do not rise above a Foot, and some Sorts not above six Inches high; these for the most Part are brought

brought from *Turkey* and *Greece*, from whence perhaps the *Romans* might have them; and what *Virgil* says of the *Phaselus*, perhaps, might not be meant to depreciate the Merit of it; but might signify that it was a Dwarf or low Kidney-Bean; that was to be sown in the Fields. I am apt to think this *Phaselus* must have some Desert, because *Columella* mentions it with the Pulse of the best Account. But this I submit to my Brother Botanists, who are the best Judges in such a Case; but, that the Kidney-Bean of some Sort or other was known to the *Romans*, I think there is no Doubt. However, as far as it concerns the Welfare of the Farmer with us, he may cultivate either the Dwarf Sort or the climbing Sort in our Climate; only taking Notice, that none of the Dwarfs require more Care than just putting the Seed into the Ground; but the other Sorts must have Bushes or Poles to support them. Before I conclude, I must observe that the *σμίλαξ κηπαία* of *Dioscorides* is the same with *Theophrastus's* *Δολιχός* or *Δολιχός* i. e. *Dolicus* or *Dolichus*.

Of the Cicer or Ciche Pea, or Ram Ciches.

This the *Greeks* call *ἐρεβίνθος* *Erebinthus* in *Latin* *Cicer*: *Pliny* and *Theophrastus* differ in the ranging these *Cicers*; but *Dioscorides* divides it into *Sativum* and *Sylvestre*; that is, the cultivated Kind, and the wild Sort. We have two Sorts of the cultivated Kind, the red and the white; but *Matthioli* adds a third, which he calls the black; but this is nothing but the red Sort, which by Time changes black. The *Cicer Columbinum* of *Theophrastus*, and that which is call'd by others *Cicer Venereum*, is the white Sort. *Matthioli* tells us, that heretofore

the *Germans* took the *Cicer Columbinum* to be a Sort of Pea, but blames them for that Error, and *Tragus* and some others were as much in the Wrong, when they took Vetches to be *Cicers*. *Galen* tells us, that *Cicers* are as windy Meat as Beans, but are more nourishing; and *Plutarch* tells us, that no Worms breed in *Cicers*, tho' all other Pulse are subject to them. These are sown in some Parts of *England*, as we do Pease, and are gather'd about the same Time. As I have mention'd two Sorts above of the *Cicer*, I shall now give my Reader a Description of them; they both bring Stalks of about a Yard long, whereon are set many small, and almost round Leaves, dented about the Edges, plac'd on each Side of a Rib or Stalk, the Flowers come from the Joints, sometimes single, and sometimes two together, upon short Foot Stalks; they are some white, others of a yellowish Colour, and some of a reddish Purple, lighter or deeper as their Pease or Seed will be that comes after them; these are contain'd in small and thick short Pods, one or two Pease at most in a Pod. The Root is small, and the Plant is annual.

Of the Cānabis or Hemp.

The *Cannabis Sativa* or manur'd Hemp with us, is allow'd by all Writers, to be the same with that which was cultivated by the *Romans*: It is of extraordinary Use for Cordage, and for making coarse Cloth for Sacks, packing, and other Uses; it has been said to be of two Kinds, the Male and Female, altho' they both rise from Seed sav'd from the same Plant, as the Plant *Mercury* does, and the Spinach with some others, some of which, always bring barren, or false Flowers as they call them, whilst the other Plants of the same sowing are fruitful; these barren Flowers, however, are always furnish'd with an enlivening Dust, which serves
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to impregnate the blossom Part of these Plants, among them that bring Seeds ; and without this Dust fall among them, or is convey'd to them, the Seeds will not be perfect, or fit for growing, as has been try'd. But whoever desires to know more of this, may find it fully explain'd in my Chapter of the Generation of Plants. In my new Improvements of Planting and Gardening, what is falsely call'd the Male Plant of the Hemp, by the Country People is really the Female, as it brings the Increase ; it has a stronger Stalk, and is more bushy, with the Leaves larger, and of a darker green Colour, and bears Seed without any plain shew of Flowers. On the other Hand, what the Farmers call the Female Plant, has for the most Part a single Stalk, with few or no Branches, which bear Flowers, but never yields any Seed, and is ripe, and must be cut down or pull'd up before the other ; they both rise to a great Height, if they like the Ground, six or seven Foot, with many Leaves set on the Stalks at pretty equal Distances, every one divided into 5, 6, or 7, and indented about the Edges, making a Form almost like the Leaves of the *Palma Cerifia*, or the Bastard Helebore, every Leaf being set upon a long Footstalk, of a dark green Colour, and of a strong unpleasant Smell : The Flowers are small, and of a pale yellow Colour, standing many together upon long spiked Branches, which turn into Dust that is carry'd too and fro by the Wind, but produce no Seed. These properly are the Male Plants as they impregnate the Female with this Dust : These Plants being weaker and tenderer than the others, and the Stalks hollow, and not so Luxuriant, make the finest Thread, and consequently weave into the finest Cloth, and is frequently distinguish'd from the other, by the Name of Summer Hemp ; but the other which is stronger is call'd Winter Hemp, because it is not fit to be

gathered or drawn till towards Winter, or not less than a Month after the other : This bears Seed as the other bears Flowers, upon long spiked Branches. This Seed is round, and contain'd in round Heads; the Roots consist of strong Fibres, which take fast hold of the Ground, but die yearly. The Seeds of this, *Matthiolus* tells us, given to Hens of common Poultry, when they forbear Laying, will soon make them Lay abundantly. This, wherever it be planted, will greatly impoverish the Land, as we find by Experience in many Places in *England*, where it has been cultivated. This is called *καλλιμαρία* by the *Greeks*, as *Cannabis* by the *Latins*.

Of Milium, or Millet.

The *Milium* of the *Latins* is the *Greek* *Κερατρίδιον*, but is call'd *Paspalos* by *Galen*; *Varro* thinks it is the *Meline*, but *Dioscorides* and *Galen* are of a different Opinion; for *Meline*, they tell us, is *Panick*. All Authors, however, agree in their Accounts of the two Sorts I shall have Occasion to mention; which are the black and the white; of which *Belonius* says, the People of *Cilicia*, who call it *Hareomen*, after the *Arabians*, make their Bread and Pultage: *Galen* likewise informs us, that it is sometimes made into Bread, but it is very brittle, not having any Tenacity in it, so that it nourishes very little; however, it is much used in *Germany*, boyl'd in Milk, and eaten with Sugar.

Matthiolus also tells us, that at *Verona*, the Bread that is made of it is much admir'd for its Sweetness, while it is hot, and is frequently eaten there; but that it grows hard and unpleasant, if it be kept any Time; 'tis of great Use in *Italy*, for the feeding of Poultry and Pidgeons, fattening them presently : But I come now to describe the two Sorts which I receiv'd from *Italy*, and brought to good Perfection in my Garden; the first is the
Milium

Milium vulgare Album, or the common white Millet, which brings several jointed Stalks rising from one Root. These Stalks, which are soft, are fill'd with a white Pithe, and are cover'd with a Kind of Hair or Down; the Leaves are long and large like those of the Reed, and partly encompass each other; the Tops of the Stalks are furnish'd with a Number of pale, yellow, long Sprigs like Feathers, bowing down their Heads, set all along with small Seeds enclosed in whitish Husks; which being separated from the Husks, are shining, and of a pale yellowish Colour, somewhat hard, about the Bigness of Rice; the Root is very fibrous, but dies yearly.

The other, which is the *Milium nigrum*, or black Millet, is little different from the former in the Manner of its Growth; but is somewhat less, and likewise its *Juba* or Tuft is of a browish Colour, and the Seed black, which is all the apparent Difference: It would do very well for some of our idle Lands in *England*, and I wonder it is not cultivated with us, for nothing that I know of, fattens Fowls better than this Grain.

Of *Panicum*, i. e. *Panick*.

Panicum, or *Panick*, is call'd in *Greek* ἐλῦμα, but by *Galen* and *Dioscorides* μέλιμη, *Meline*, and by *Diocles* μελίνου, which most are of Opinion was rather taken from μέλι, quod melleum quidpiam significat, than from μέλανου, which is black, and it is likely from hence *Pliny* calls it *Melfrugum*. *Theophrastus* makes the *Elimos* and the *Meline* to be two several Plants; and *Pliny* tells us, *Panicum a paniculis dictum* fuit, and puts it among the Corns, as does also *Dioscorides*; but *Galen* and *Columella* places it among the *Legumine* or *Pulses*. This *Panick*, which I shall have Occasion to mention, affords little Nourishment; and *Galen* tells us, That it is not

near so good as Millet for any Purpose: 'The Millets are much sweeter, and easier of Digestion than Panick, altho' the Country People feed upon it, when it is boyl'd in Milk, as they do Wheat; and he adds, that the *Italian* Sort is far better than that of *Asia*, which was his own Country.

Joannes Leo, in his History of *Africa* says, That in some Places they make very fine Bread of Panick; but he does not tell us of which Sort, for there are a great many Kinds of it, which are brought to *England* every Year from the *East* and *West Indies*; 'tis a very fattening Food for Fowls. The Panick which I am about to mention, which was that used by the ancient *Romans*, loves a fat Soil; but *Columella* will give us an Account of its Culture, so shall say no more in this Place than what relates to the Description of the Plant.

The *Panicum album vulgare*, or common White Panick, is the Plant which was cultivated by the ancient *Roman* Husbandmen, and is now part of the Care of some Farmers in *Italy*; tho' truly not only the old *Roman* Husbandry, but even several of the Plants they were used to cultivate in *Italy*, are in a Manner Strangers to that Country at present; and it is certainly a very just Observation of a late Commentator upon *Virgil's Georgics*, that we have more of the ancient Husbandry of the *Romans* now practised in *England*, than even in *Italy* itself.

But this Panick brings a pretty strong jointed Stalk full of Pith, but without Down, as Millet has: This Stalk brings large Leaves at the Joints, larger than those of Wheat, and so like the Leaves of Millet, that they can hardly be known assunder; on the Top of the Stalk there appears a long round close Spike of a whitish Colour, round at the End and soft, and seemingly cover'd with Down, with small short Branches the whole Length, which discover themselves when it is
full

full ripe and open'd, full of hairy soft Husks, which include small white Seeds, less than the Seed of Millet, and not so shining; the Root is very fibrous like that of Millet, but smaller: This Plant is an Annual; I have had some Seeds of this Plant from *Italy*, and find it will do very well in our Climate.

Of the Sefama, or Sesamum, call'd, the Oily purging Pulse of the Ancients.

All Authors agree, that the Plant I shall here describe, is the *Sesamum* of the Ancients, the *Greeks* name it *Σισαμ* and *Σισαμον*, and the *Latins* *Sesama* & *Sesamum*. 'Tis a Plant well known in *Egypt*, as *P. Alpinus* tells us; it is call'd there, says he, *Sempsem*, and the Oyl of it is call'd *Syris*. Many Authors place it among the Grains or Corns, while others place it among the Pulses, which all of them, that we now know, bring their Seeds in Cods, of some Fashion or other; but why it is rank'd among the Corns I cannot understand, unless it might be because the Ancients used to put the Seed of it into their Bread, as they did poppy Seed, and that it was sown in Fields by the *Romans* as they did Bread Corn.

Theophrastus, in distinguishing the Kinds of Grain makes three Sorts: The first, Wheat, Barly, &c. the second, Beans, Pease, &c. the third, Millet, Panick, and Sesamum. The Corn brings Spikes or Ears; Pulse bears Cods; and his third Sort as Millet bear a *Fuba*, as he says, like the feather'd Top of the Reed. Such indeed we find in the Millet and Panick, but rather might be placed among the Legumes or Pulse, as *Columella* has done, because it bears its Seeds in Pods; but strictly, according to the Modern Method of classing of Plants, this is neither one nor the other, neither a Corn nor a Pulse; but *Galen*, as well as *Columella*, places it

it among the Pulse, and tells us, that in his Time it was eaten, as other Pulses were. One may see the Manner of preparing the Oyl of *Sesamum* in *Belonius*. *Dioscorides*, and also *Galen* say, that it is hard of Digestion, and yields a gross Nourishment, and is very fattening. Mr. *Tournefort* in his Voyage to the *Levant*, observ'd great Quantities of this *Sesamum* growing on the Islands of the *Archipelago*; 'tis now much neglected in *Italy*, and rarely found there but in some curious Gardens; and we have here and there some Plants of it in *England*; but I can't find it is a Plant which is any ways agreeable to the modern Diet of the *English*, and therefore do not expect to find it ever cultivated with us in large Quantities, unless it be for the sake of the Oyl, or for a dry Fodder for Cattle; however, in this Work it is necessary that I give my Reader the Description of every Plant mention'd by the ancient Writers of Husbandry, for the better Understanding of their Works; and that we may the better determine how far we have improv'd since their Time, or whether we have lost any useful Branch of their Husbandry.

The *Sesamum*, upon its first Appearance from the Seed, shews us three or four longish Leaves somewhat broad, between which come forth others, which, when they are full grown, are as large as the Leaves of the great Nightshade; some of them being more indented than others, appearing as if they were torn, especially near their Foot-stalks. The main Stalk rises from among the bottom Leaves, is straight, thick and round, near two Foot high; from whence spring out on every Side many Stalks of Leaves like the former, if it likes the Ground, and is warm enough situated, or else only grows with a single Stem; when it is in its full Luxuriance, it flings out most commonly two Stalks from each Joint, and at each Joint quite to the Top of the Plant, appears a single white Flower, somewhat

what like the Flower of a *Campanula*, *Monopetalous*, or made up with one Leaf or Petal, without any Division on the Edges, containing a few Apices, which are not tall enough to be discover'd without opening the Flower. When the Flowers are past, they are succeeded by small, long and hard Seed-Vessels, having three or four, and sometimes five Cells; in which is contain'd, small flat Seeds of a pale yellow Colour. The Root is somewhat large and long, with several Fibres joyning to it, which take firm hold of the Ground; the Leaves, Stalks, and Seeds, are so bitter, while they are green, that Cattle will not touch them; but being dry'd become agreeable to them, and soon make them fat. The Seed being full ripe, and press'd, yields more Oyl than Linseed, and is very sweet, when it is fresh, and of a whitish Colour; it will keep a long while without growing strong.

I should now proceed to describe the *Lupine*, which is so highly commended by *Columella*, according to the Order; he has plac'd it among his Pulse, in the Chapter now before us; but as he sets a Value upon it chiefly as a Manure for Lands, I have already had Occasion to treat of it at large, in the Chapter which relates to Dungs, and Manures, to which I refer my Reader, and proceed to give a Description of the *Linum* or Flax, which follows next in Order after the *Lupine*.

Of the Linum or Flax.

The *Linum* is the *Greek* *Λινον* which signifies either the growing Plant, or the Plant prepar'd for spinning, or the Cloth made of the Plant; we may observe, that the *Romans* generally preserv'd the *Greek* Names of the Plants, I have had Occasion to mention in this Work, which is one Proof that they learn'd the greatest Part of their Husbandry from the *Greeks*: And if we add to this the early
Accounts

Accounts of these Things which we find in the *Greek* Authors; we have then little Room to suspect they were the Inventors of any valuable Particulars in Husbandry: Nor indeed can it be made appear, that the *Greeks* themselves were the Inventors of every Branch of Husbandry, which the *Romans* learn'd from them; for it is highly probable, that the *Greeks* had the main of their Skill in that Art from the *Ægyptians*, with whom they held a considerable Commerce; but they certainly were diligent in making Discoveries, and were great Refiners of every Thing they took in Hand. The *Romans* help'd to preserve their Practice, and by them we were taught a great Share of what we know of Husbandry; and among the rest, 'tis very likely, we first learn'd the Culture of Flax, which is the *Linum Sativum*, I am now to describe.

The manured Flax brings a slender round pliant Stalk, about three Foot high, but is longer or shorter as it happens to agree with the Soil it grows upon; these Stalks are beset with long, narrow, soft Leaves without Order: The Plant branches towards the Top, bringing at the End of each Branch, two or three blue Flowers, compos'd of five round pointed *Petals* or Leaves a-piece, with some Pieces in the Middle of the Flower of a yellowish Colour; after which, come round Pods pointed on the Top, wherein is contain'd flat and shining brown Seeds; the Root is small and fibrous, dying yearly. It is cultivated in many Places in *England*, for the Sake of the fine Cloth, which is made of its Stalks after they are dress'd and prepar'd; and also for the great Use the Seeds are off for making of Oyl, which is very much us'd by Painters for binding their Colours, either on Wood, Cloth, Stone, Iron or Glass; as also for burning in Lamps, lasting much longer than the Oyl of Olives; besides its Use in Physick,

is

very considerable. *Galen* tells us, likewise, that the Seed was us'd by several People, as a Food, being first parched, and then mix'd with Honey; and that some, also, put it into their Bread; but he adds that 'tis hard of Digestion, and affords very little Nourishment. But I now come to speak of *Ordeum* or Barley, which *Columella* places among the Pulse, *quia ex eo ptisana est*, as he says.

Of Hordeum or Ordeum, Barley.

The *Ordeum* or *Hordeum* of the *Latins*, is the *Greek* *Κριθύνη*. There are two Sorts of it mention'd by *Columella*; the *Ordeum Galaticum*, and the *Ordeum Cantherinum*, which last Sort, he says, the People call *Hexasticum*, both which I shall describe in their proper Places. This second Sort of *Columella's* is call'd by *Codrus Hyemale*, or Winter Barley, and by others *Polyssicum*. *Codrus* tells us, likewise, that altho' the *Hexasticon* produces six Rows of Grain upon each Head, yet the other Sort which produces but two makes us amends by the great Number Stalks that rise from one Root; for he observes that he has seen upwards of sixty Stalks rising from one Root, but that it has usually twenty, thirty or forty Stalks upon a Plant.

Barley was a Grain highly esteem'd among the Ancients, as well for the Meat they made of it, as for the *Ptisana* or Drink, as *Columella* says, which was made from it: This and Wheat, were, and are now, the principal Grains for the Support of the Life of Man, but the Barley seem'd to carry the Day among the ancient *Athenians*; however, it must be acknowledg'd, that it does not afford so much Nourishment as Wheat, because it is a dryer Grain, but maketh a more wholesome Drink than Wheat alone will do, which is too sweet and fattening for the Body; but Barley in all its Parts,
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are more cooling and cleansing, except it is made into Malt, which something alters its Quality. *Dioscorides* tells us, that all the Preparations of Barley, such as Barley Water, and *Ptisana* Drink, are very nourishing; and it is observ'd, likewise, by some Writers, that Barley steep'd in Water, being given to Hens of common Poultry, which seldom lay, will make them lay Abundance of Eggs. As for the several Preparations made of this Grain by the Ancients, I shall speak by and by; and in the mean Time describe those Sorts of Barley which were us'd by the *Romans*.

The first is the *Hordeum Distichum*, or our common Barley, which is the *Ordeum Galaticum* of *Columella*; this Sort has shorter and tenderer Stalks than Wheat, and the Leaves shorter, broader and rougher; the Ear is short, set with two Rows of Grain, in very regular Order, each of them enclos'd in an Husk, having a long rough Awne or Beard at the Extremity, which is larger and longer than Wheat, and is somewhat whiter; this Grain does not so easily quit the Husk, as Wheat does; the Root is large and spreading, commonly bringing a great Number of Stalks, which sufficiently make up for the Smallness of the Ear.

The next is the *Ordeum Cantherinum*, or *Hexastichum* of *Columella*, which is a Winter Barley, nam'd *Hordeum Polyficum sive Hybernum*, it grows like the former, both in Stalk and Ears, only differing in having fewer Stalks rising from one Root, and in having more Rows of Grains upon one Head, than the former; sometimes bringing four, sometimes five or six Rows of Grain upon one Ear; and one Thing more, which is the sowing it for a Winter Crop. *Lobell* tells us, we had enough of this Sort in the West of *England*, in his Time; and I now find it cultivated in many Places on that Side of the Country, which makes me suppose it was brought there by the *Romans*. We have be-
sides

sides these, some other Sorts of Barley cultivated in *England*, but they do not belong to this Work. Having now describ'd the two Sorts of Barley, mention'd by *Columella*, I am in the next Place to give some Account of the several Uses they were put to by the Ancients, and first of the *Polenta*.

The *Polenta* of the Ancients was a Preparation of Barley, prepar'd after different Manners, according to the Minds of the People that made it. *Pliny* tells us, that some *Grecians* made it of green Barley, taken from the Ear before it was ripe, steep'd in Water, and after that, beaten in a Mortar, and wash'd in Baskets to take away the Hulks, then dry'd in the Sun, and steep'd and beaten a second Time, untill it was thoroughly clean, and then dry'd, and ground small. To twenty Pounds of this Flower, was put of *Linseed*, and *Coriander* Seed, of each, one Pound and half, with about two Ounces of Salt, being all well bruis'd and mixed together.

The *Romans* made this Preparation of parch'd Barley, without giving it any Moisture, but ground it small, and added to it the Ingredients mention'd above, with some Millet-Seed.

Pliny goes on and tells us, that others among the *Greeks*, made it of Barley, moisten'd for a Night, and after they had dry'd and parch'd it the next Day, it was then ground.

Galen commends that Sort as the best which was made of unripe Barley, before the Beards or Awns were over dry, and that had been parch'd but little, without adding any Thing to it. This *Polenta* was us'd by many Nations, says that Author, instead of Bread; but especially the People of *Cyprus* had this in Use among them, altho' they had good Wheat growing in their Country: This, says he, is more drying and binding than plain Barley; if it be taken with Red Wine, or drank with Water, quencheth Thirst; it was often eaten with a little
new

new Wine, or warm'd Wine put to it, as every one pleas'd. Thus far of the Preparation call'd *Polenta*; the next, is that, which the Ancients call'd *Maza*, which is still a Kind of *Polenta*, being made of parch'd Barley mix'd with some Sort of Liquor, as every one thought best; some us'd nothing but Water, while others put both Water and Oyl to it, as *Hesychus* tells us; and as *Hippocrates* informs us, some put sweet Wine to it, and others Honey. the next Preparation is call'd *Ptisana*, which was esteem'd by the Ancients as the best of their Drinks; it was made of several Sorts of Grain, and not only of Barley. It seems by what *Columella* remarks in this Chapter, when he mentions the *Ptisana*, that he admir'd, that which was made of Barley before any other; the Ancients had their *Cbondro Ptisana* made of *Zea*, *Pyriua Ptisana* made of Wheat; and *Pliny* says, that *Italy* which abounded in Rice, made *Ptisana* of that also; and *Galen* likewise informs us it was made of Pulse, for he tells us of *Phacoptisana* which was made of *Lentills*; but *Ptisana* simply, without any Addition, is always understood to be made of Barley, only husk'd to make it more excellent. We find the Manner of making it set down by several Authors, as *Pliny*, *Galen*, *Dydimus* and others; but because *Hippocrates* has so far done it Honour, as to write a whole Treatise in Praise of it, both made into *Polenta* and *Ptisana*, I shall give my Reader the Method of preparing it for both Uses, from his Writings.

For *Polenta* he directs us to take the best Barley, and moisten it with Water for three or four Hours; then put it into a coarse Bag, and beat it with a Mallet, or Pestle of Wood, untill it has quitted the Husks; then wash it and dry it in the Sun, and keep it to use as Occasion serveth to make *Polenta* of it.

To

To make *Ptisana* of it, he directs us to boil it gently in Water, 'till it break ; and that the Liquor be thick like Cream, which will then be lenifying, sweet, and slippery, and being moderately Liquid, quenches Thirst by the moistening Quality. *Dioscorides* adds, that the Cream of *Ptisana*, by Reason of the boiling, affords more Nourishment than the *Polenta* which is made of Barley : This was the Manner the Ancients made their *Ptisana*. I shall next give my Reader some Account of their *Zythum*, which was another Preparation of Barley.

We are beholden to *Theophrastus* and *Dioscorides* for first mentioning the Drink call'd *Zythum* ; and for telling us of what it was made ; but it seems it was so common with them, that they did not think it worth their while to give any farther Account of it, than to say it was a Drink made of Barley ; but *Diodorus Siculus*, goes a little farther, and tells us, *Zythum* was a Drink made of Barley, chiefly us'd in *Galacia*, where there was neither Wine nor Oyl. *Pliny* makes this a little plainer to us, in saying that Drinks were made of several Sorts of Grain, as *Zythum* in *Ægypt*, *Cælia*, and *Cærea* in *Spain* ; which was likely so in *Pliny's* Time, and before they had planted the Vine : He then mentions the *Cirevisia*, and other Sorts of Drink in *Gallia*. 'Tis a receiv'd Opinion, that this was the same Sort of Drink which we now call Ale, or somewhat like it, varying only according to the Manner of the Country where it was made, and according to the Goodness, Quantity and Diversity of the Grain, of which it was made ; and also of the Water, which is a main Article to be consider'd, in brewing or preparing any Drink. We are very sensible, how much inferiour such Drink as is made of brackish Water is, to that which is made of Spring Water ; and again, how far different that is, which is made of

clear Spring Water, from that which is made of our *Thames* Water; nay, of Drinks that are made of Waters from two different Springs, one will be much better than the other, tho' the same Quantity of Grain has been us'd, and the same Person has made them both; Water from a Chalk, Water from a Gravel, Water from a Clay, all have different Qualities.

But Diversities of Grain, likewise, make a great Difference in Drinks; as for Example, if it be made of Wheat alone, it would be too thick, and too sweet, or of Oats, it would be too poor and thin; but the Quantity of Grain is all in all, to give it the Share of Strength, or make it durable.

Petrus Bellonius is of Opinion, that this *Zythum* of the ancient *Greeks*, is the same Sort of Drink, that the *Latins* call'd *Pusca* or *Posca*; and which is mention'd by *Columella*, *Seraphio*, and *Avicen*; but is different, as he says, from *Cerevisia* or Ale, because it is white like Milk, is thick, and very nourishing, but fumes into the Head, and causes Drunkenness, if it be taken in too great Quantity; this Sort of Drink, he tells us, is usually sold in all the Cities of *Asia*, in Tap-Houses appointed for it. In *Devonshire*, about *Exeter* they have white Sort of Ale, which answers exactly to this Drink which *Bellonius* describes, which is call'd by an odd Name, which I cannot remember; but is easily known in those Parts, by the Name of the white Ale; and I suppose, they have had it among them, ever since the *Romans* were in *Britain*; and they have many Things with them in their Way of Diet, which I do not find any where in *England* besides: and I suspect them to be *Roman*, because that Part of the Country was chiefly frequented by the *Romans*, after they were conquer'd by them; and 'tis there more particularly, that the *Roman* Husbandry is in Practice, more than any other Part of *England*. This white Drink, *Bello-*

nus adds, was call'd by the *Asiatics Chouffet* ; and to strengthen his Opinion, quotes a Place in *Suetonius*, where he relates, that *Cæsar's* Bondman, who fled from him, was found in *Capua*, selling *Posca* in a Tap-House ; and therefore, that *Posca* could not be *Oxycratum*, as some think, which was Vinegar and Water ; but was this *Zythum* : But *Scaliger* in his Anotations upon *Bellonius*, as may be seen in *Clusius's* Exoticks, shews how much he was mistaken in this Account.

The *Chouffet* of the *Turks* is made after another Manner, than any of the others mention'd above, and may not be improperly set down in this Place, the Manner of making this Liquor. says *Scaliger*, is with Meal made into Past, and boyl'd in a great Cauldron ; after which, it is fram'd into small Balls, and thrown into Water, which will presently boil up of itself. and grow hot without the Help of Fire, and become a Kind of thick Drink, whose Yest, says he, is Light and white ; with which the *Turkish* Women us'd to anoint themselves, when they were bathing to make their Skin smooth and delicate ; and this Faculty the Ancient Writers attributed to *Zythum*. But I now proceed to give some Account of that other Drink, us'd by the Ancients, which was call'd *Curmi*.

Dioscorides mentions the *Curmi*, to be a Sort of Drink made of Barley, but gives us no farther Account of it ; nor *Pliny* neither, says any more of it, than what is related above, that *Cerevisia* was made in *Gallia*, and other Kinds of Drink in other Countries ; 'tis therefore, many think, that this *Curmi* was a Sort of Ale, somewhat differing from *Zythum* : Now that Ale, was the most ancient Drink of our Land, seems probable from the *Welsh* Name for it, which is *Curw*, which is not vastly different from *Curmi*, which is the *Cerevisia* made in *Gallia* ; and besides, that the *Welsh* should have many Things among them,

which were common with the ancient *Gauls*, seems reasonable enough, when we consider that the Language in *Picardie* and *Normandy*, which are Parts of *France*, and lye the nearest to *Wales*, retain at this Day a great Number of *Welch* Words, insomuch, that the People of those Provinces, are hardly capable of being understood by the Natives of other Provinces in *France*, but can make shift to converse with the People of *Wales*. One might enlarge very much upon this; but my Business at present is of another Nature. 'Tis likely this *Cerevisia* might be made of Malt, which the *Greeks* call'd *Buin* and the *Latins* after them *Byne*, which was Barley steep'd, and of latter Date was call'd *Maltum*, a Name taken from the German Word *Mauth*, and our Malt, both signifying the same Thing; the Word *Byne* is us'd by *Œtius*, and is by all Translators allow'd to signify Malt; especially, since he has describ'd to us the Manner of making it, which confirms to us, that it can be nothing else. But I shall now conclude my Remarks upon the *Legumes* or Pulse, as *Columella* calls them, and enquire into the several Sorts of Fodder, which he mentions in the same Chapter; the first, of which, is the *Medica*.

Of the Medica.

The *Medica* I am about to speak of, is set down by the most judicious Writers, to be the *μίσκον* of *Dioscorides*, which *Pliny* says, was brought from *Media* into *Greece* by *Darius*, from whence came the Name *Medica*, and from *Greece* in all Likelihood, was first brought among the *Romans*, and from *Italy* was brought to *Belgia*, or that Part of the 17 Provinces, which is call'd *Flanders*, where it is now cultivated as well as in some Parts of *France*, from whence we first receiv'd it, as I shall mention by and by. In *Burgundy*, it first lost its
Name

Name of *Medica*, and was call'd *Fœnum Burgundicum*; but has since recover'd the old Name again of *Medica*, and is call'd now *Medica Legitima*: this is call'd by *Avicen* and the *Arabians*, Cot *Alfifafat*, but by the *Spaniards*, *Allafalsaga* and *Alfalfes*; which I suppose is the *Moorish* Name, which either has remain'd with them ever since the *Moors* conquer'd their Country, or what they have learn'd from the *Moors*, by Reason of their near Neighbourhood to them; for the *Moorish* Language, is a Corruption of the *Arabick* in many Words; but especially in Plants, and other Goods of Traffick, or such Things as are natural to *Africa*, where both Parties reside. This the *French* call *Saintfoin*, and *Foin de Bourgogn*, and the *English*, *Medick*, *Fodder* and *Snail Clover*, or *Trefoil*: The Use which the Ancients made of this Herb, was, to feed their Cattle, and to fatten them, as appears by all the ancient Writers of Botany; and particularly, by *Columella*, and the other *Scriptores de re Rustica*: It was held to be so powerful to fatten Horses and other Beasts, that the Farmers thought it proper to stint them to a certain Quantity, for fear of suffocating them by too much Fat.

But I come now to describe the *Medica legitima* of *Dodoneus*, *Clusius*, and others, which is that, which was cultivated by the Ancients: it is call'd *Snail Trefoil* of *Burgundy*, and by the *French*, *Saintfoin*; which *French* Name our Farmers know it by, and have cultivated it now about fifteen Years to very good Profit. This Plant brings many weak, green Stalks, bearing *Trefoil* Leaves of a darkish green Colour, set irregularly upon the Shoots of the Plant. The Flowers grow upon long Stalks, coming from the Joints and Tops of the Branches in Clusters, making a short, thick Tuft of a blueish purple Colour in some, but in others vary in their Colours, some being of a paler Blue, others of a more reddish Purple, or of mix'd Blue, and Yel-

low Colours strip'd ; after which, come small round Cods. somewhat resembling Snails, close set together ; in which are inclos'd the Seeds, which are small and pale ; the Root grows somewhat deep in the Ground, and lasts a long Time.

The next Herb for Fodder, which *Columella* mentions, is the *Fænum Græcum*, or as we have it in *English*, Fenugreek ; that which we are about to speak of, is call'd *Sativum*, that is the cultivated Sort ; *Dioscorides* calls it *τάχης*, and by others *αλεξις* ; but by *Theophrastus* *βῆρας* a cornu similitudine sive sit *Capri vel Bovis* ; the crooked Seed Vessels, resembling Horns. *Columella* says, it has two Seasons of sowing, the one before Winter to be Fodder for Cattle, the other in *February* for Seed. *Varrro* calls it *Silicula*, and *Pliny*, *Silicia*. The modern *Italians* call it *Fiengreco*, a Corruption of the old Roman Name, *Fænum Græcum*. *Columella*, and the other ancient Writers of Husbandry, place this among their richest Fodders for Cattle. But this is seldom cultivated by any of our *English* Farmers ; the Seed may be had at most of the Seed-Shops. But it remains, that I give some Description of the Plant.

The *Fænum Græcum Sativum*, riseth from the Seed, sometimes with one, and now and then with two or three hollow, green Stalks, which divide themselves into Branches, whereon the Leaves are set at unequal Distances ; but three always set together on a Footstalk, almost round at the Ends, and a little dented about the Sides, Green above, and Greyish underneath ; from the Joints, where the Leaves grow, come forth the Flowers which are white, and after them crooked long Horns, somewhat flat, and small pointed, containing yellowish corner'd Seeds within them ; the Root is fibrous, but perishes before Winter.

The next Fodder mention'd in this Chapter by *Columella*, is the *Vicia*, which is that call'd *Vicia Vulgaris Sativa*, or in *English*, our common manured Vetch or Tare, the Βικιον or *Bicium* of *Galen*, which he tells us, was common in *Asia*, where he liv'd, is allow'd to be the same with the *Vicia* of the *Latins*; the *Athenians* call'd it σαρχιον and κριαμον i. e. *Saracum* and *Syammum*, and *Mattheolus* calls our Vetch *Aphace*. This Sort of Vetch or Tare is well known to our *English* Husbandmen, it brings many square Stalks from one Root, rising sometimes two Foot high, entangling themselves one with another, so that they need no other Props; the Leaves are wing'd, and are set upon slender Ribs on both Sides. The End of each Rib dividing itself into two or three Claspers, the Flowers, which are long and narrow, come in Pairs. and are of a deep purple Colour, succeeded by long and somewhat broad Cods, wherein is contain'd five or six flat blackish Seeds, but in some are of a greyish Colour; it has a fibrous Root, which dies every Year.

Columella then goes on, *Proxima deinde Cicera, & Ervum, & Farrago, quæ est ex ordeo.* The *Cicera*, or *Cicbe Pease*, or *Cicers*, I have mention'd above, and described what they are; so that I have no further Occasion to say any more of them, than that *Columella* mentions them here as a Fodder for Cattle.

The next Plant he mentions is the *Ervum*, or *Orobus*, from the Greek ὀρόβος. quod Boves eo saginentur, as *Galen* informs us; *Dodoneus* calls it *Mochus*, which is *Orobus*, and *Lobel* names it *Orobus receptus herbariorum*, because it is allow'd by all Comentators upon the ancient Writers of Husbandry to be the true Sort of *Orobus* which they mention. The Modern *Italians* still preserve something of the Name given it by their Predecessors, calling it *Ervo* from *Ervum*; and we in *England* call it the bitter Vetch, to distinguish it from the

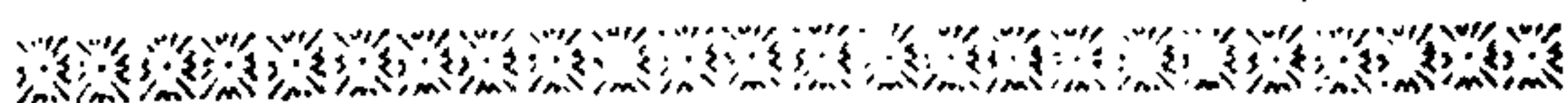
other Sorts of Vetch. In *Galen's* Time, the Seed of this Plant used to be steep'd like Lupines, to take away the Bitterness, and was eaten by the People as well as the Cattle; but *Columella* makes it further useful, by making the whole Plant a good Fodder for Cattle.

This *Orobus*, or *Ervum*, brings several weak and slender Branches, which rest themselves upon the Ground, and rise above a Foot high, beset on all Sides with wing'd Leaves, each of which is very small, placed one against the other like Cicers, Vetches, and some other Pulses: The Flowers are small and whitish, standing single at the Joints, after which come small round and long Pods knotted in three or four Parts, bunching out where the Seed lyes, which is almost round, is small, and of a pale Colour. This Plant has a small Root, and is annual: I do not find that any of our Farmers have yet cultivated any of it; I suppose because they have already so many Sorts of good Fodder; but however, upon such Grounds where these will not prosper it may be try'd, and we have enough such Lands in *England*. It is raised in most curious Gardens about *London*, from whence Seed may be had.

It now only remains that I speak something of the *Farrago*, what it is, and to set forth the different Kinds of it used by the Ancients. *Varro* and *Columella*, when they speak of it, mean nothing more than a green Fodder for Cattle. In this Chapter indeed is only mention'd that of Barly, which is the green Herb cut or mow'n; and *Pliny* tells us of a *Farrago* made of Wheat, which is no more than green Wheat treated in the same Manner; where great Armies happen to be. This is a common Forage with 'em, and 'tis likely the Word Forage is taken from *Farrago*. *Tragus* took it to be *Siligo*, *Codrus* on *Dioscorides* took it to be *Olyra*, and some others to be the *Typha* of *Theophrastus*

phraſtus; and it is likely *Farrago* was made of every one of theſe, as well as of Barly; but I find moſt Authors allow that of Barly to be the beſt.

Thus I have given my Opinion concerning the ſeveral Kinds of Grains and Pulse mention'd by *Columella*, and the other ancient Writers, with the Senſe of moſt Authors who have treated on them: I ſhall in the next Place proceed to enquire into the Method of their Culture, as the Ancients have ſet it down.



C H A P. IX.

*Of the proper Seasons for ſowing of Grain,
&c. from Columella, and others, with
Remarks.*

VIRGIL is of Opinion, that neither Wheat nor *Adoreum* ſhould be ſown till the *Vergiliæ* are ſet.

*At ſi triticiam in meſſem, robuſtaq; farra
Exercebis humum, ſoliſq; inſtabis ariſtis
Ante tibi Eoæ Atlantides abſcondantur.*

Now this Conſtellation ſets ſix and forty Days after the autumnal Æquinox, which happens about the Ninth of the Kalends of October; by which Account we are to begin ſowing of Wheat from the Sixth of the Ides of November, which is the Time the *Vergiliæ* ſet, and may continue that Work till the Beginning of Winter. Thus the judicious Farmer will neither plough his Ground, prune his Vines, nor cut his Trees, till about fifteen Days before the Winter begins, or elſe in the fifteen Days after Winter is paſt. We alſo allow
them

them to be proper Seasons for sowing, provided the Soil be warm, and not over moist; but in wet Land, or poor cold Ground, or in such Places as lie open and expos'd, the best Time for sowing is about the Kalends of *October*, while the Ground is dry, and before the Rains begin to fall, that the Corn may have got good Hold of the Ground, and gather Strength enough to defend itself against the Frosts and cold Rains.

But let this sowing be never so seasonable, we must take Care to raise our Ridges high enough to carry off the Wet when it falls.

Some are of Opinion, that we should not sow our Corn till after the Ground has been moisten'd with Rain, which I own may do very well, if it is follow'd by a favourable Season; but then we must not wait too long for the moistening of the Ground before we put in our Corn; however, this is commonly practis'd in some Provinces.

Now if we Sow our Corn while the Ground is dry, and harrow it well in, it will lie there as safe from Corruption as if it was in the Barn; and when once it has had the Benefit of a few Days Rain, we shall see our Corn appear above Ground in one Day.

Tremelius tells us, that if our Corn lies long in the Ground before the Rains fall, the Birds and Pismires will devour and spoil a good Part of it, which we find to be true; but however, the *Adorem* and other Sorts of Wheat being sown in their Husks, will help to preserve them, and especially defend them from the Injuries they might otherwise receive from too much Wet.

This is the Advice which the ancient Writers of Husbandry has given us concerning the Season of sowing Corn, let us now examine how far their Directions are agreeable to the Practice of our *English* Farmers.

Virgil

Virgil tells us, we must not begin to sow our Wheat till after the setting of the *Vergilia*, which happens to be the Sixth of the Ides of *November*, according to the *Roman* Account, which answers to our Eighth Day of *November*: This in an *Italian* Climate may do well enough, where the Rains do not begin to fall so soon as in *England*; but with us, *November* is generally a very wet Month, and therefore it is more profitable to the Farmer to have his Winter Corn in the Ground before the wet Weather comes in; for I hold, that if we sow our Corn when the Ground is very wet, the Grain cannot be so easily cover'd, and perhaps not above half of it bury'd as it should be, a great Part of it sticking so fast to the Clods, that they never can be well cover'd, especially where the Ground is stiff. When the Land happens to be of this Sort, tho' the Farmer has made it as fine as possible by summer and cross ploughing, yet would I advise him rather to plough in his Corn when he sows it, than trust to the Harrow for the burying it as it ought to be; for tho' the Ground be wet by great Rains, when we should sow our Wheat, yet when we come to turn it up with the Plough, we shall find the Ground more open and fit to receive the Grain, than if it had been first plow'd, and the Rain fallen upon it before we put in the Seed.

Tremelius very well observes, that if we sow our Grain when the Ground is dry, and especially if it is a light Soil, great Part of the Seed will be destroy'd by Pismires and Birds, which with *Columella* I allow to be true; but I am of Opinion, the Birds eat little more of the Corn than what they find upon the Surface and would never grow, without digging for it; and if they brined their Corn, as we do now a-days, I cannot think the Pismires would be very fond of it; but however, according to the Observations of these ancient Writers,

ters, if they were to prepare their Corn before they sow'd it, with Lees of Oyl, it would be well guarded against those Insects; for they tell us in their Accounts of making the Thrashing Floor, that strewing Lees of Oyl upon it will keep both the Pismires and the Mice from it.

But if we sow our Corn while the Ground is dry, the Grain, as *Columella* says, will remain there as free from Corruption, as if it was in the Barn, which we are well assured of; Witness the Summer 1723, when many Fields that were sown with Barly, lay dormant, till some great Rains in July had sufficiently moisten'd the Ground to bring it up, and then on a sudden there appear'd a fair Prospect of a plentiful Crop, which through the favour of the Season which follow'd, ripen'd very well. Again, it is observable, that the Seeds of Plants, if they happen to be bury'd in the Ground below a certain Depth, which they naturally require, they will not come up, but remain, without either rotting or sprouting, for many Years; till it happens that by plowing or digging, their Station is alter'd to the just Depth of Soil they require: They then sprout, and grow as well as if they were gather'd fresh from their Mother Plant. This is partly confirm'd by the great Quantity of Mustard, which always appears in some Parts of *Essex*, upon the breaking up old Grass-Lands, or in the digging of Ditches or Ponds, which opens the Ground, and turns up the Seeds of this Plant to a convenient Station for their Growth; and this has happen'd in such Places, which have lain undisturb'd, longer than the Memory of Man could reach. We have also a memorable Instance of what I say in our *English* History, of a Field, which had lain many Years uncultivated, but was plow'd after some great Dearth, and before it was prepar'd, or, as the Farmer thought, was render'd fine enough to sow Corn upon it; he was surpriz'd with
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a considerable Crop of Wheat, which came up of itself, and brought him a very great Profit; but if we were to go into the Gardens, for Examples of this Kind, we should presently find Witnesses enough to prove, that Seeds may lie many Years in the Earth without corrupting; and even to maintain so much of their Strength as to equal, if not surpass, the Luxuriance of Plants growing from fresh Seeds.

The Observation which we have in this Chapter, that our Wheat should be sown at such a Season, as it may gather Strength enough before Winter to resist the Frosts, is no less worthy our Regard in *England*, than the Care of the *Italian* Husbandmen; for undoubtedly, when Plants of any Sort are in their first tender Shoot, their Juices are more apt to be frozen, and spoiled by hard Weather, than such Plants as have had Time enough to have their Vessels gather Strength; and the Juices in them, thicken and harden themselves: And then again, when our Lands lie wet, it is no less necessary to observe the Directions given us in this Chapter, of laying our Ridges pretty high, to fling off the Waters, which may either annoy us from great Rains, or the Overflux of Rivers; for when Water lies long upon our green Corn, it grows sickly, and turns yellow; and even is sometimes so much glutted with it, that it rots, or at least brings such a flashy Grain, as will by no Means answer the Farmer's Expectation, if he was to use it as soon as it was gather'd; but if it was to lye by, it would soon grow mouldy, and not only become unfit for Use of itself, but infect the Corn which happen'd to lie near it; so that we cannot be too cautious in ordering our Wheat-Grounds, in such a Manner as may keep our Corn free from the Injury of too much wet; no more than in taking Care upon the Housing of our Corn, to keep such Part of it, as may by Chance
have

have had too great a Share of wet, by itself; or rather, as I have said before, let it be us'd as soon as ever it is fit for thrashing.



C H A P. X.

Of the Quantity of Grain or Seed requir'd to sow a Roman Acre of Ground, from Columella, and others; with Remarks.



Roman Acre of Ground, if it be very rich, requires commonly four Bushels of Wheat to sow it; but if our Ground be but indifferently good, we may allow it five Bushels of Seed.

In the sowing of the *Adoreum*, we allow nine Bushels of Seed to a *Roman Acre*, if the Ground is very rich; but if it happen to be of a poorer Sort, then we must allow ten Bushels of Grain to be sown upon the same Quantity of Ground. These are general Rules which I lay down; but the Quantity of Seed for an Acre, must be varied according to the Situation of the Ground; for the Sides of Hills, and plain Grounds, do not require the same Quantity of Seed one as the other. In plain Ground, all Sorts of Corn thrive the best, if it be a free open Soil, and is well expos'd to the Sun: In this Case some allow but eight Bushels of *Adoreum* to a *Roman Acre*.

We should likewise consider the Climate, whether it be subject to moist Weather, or great Rains, or whether it is more subject to be dry; for without this Thought, it is very likely, that he who puts his Corn the first into the Ground, may be the last in reaping a Crop.

It

It is observable, that tho' the Hills bring the strongest Grain, yet, they do not yield so much Wheat as other Lands.

We find that a chalky moist Soil, is not disagreeable to the *Siligo*, nor the *Adoreum*.

Barley loves a light dry Soil, either fresh, or such as is lain fallow for some Time; it will upon such a Soil as this, bring a noble Crop; this will either grow in a fat or in a hungry Soil.

This Corn, if Necessity obliges us to sow it upon a wet Clay, after great Rains, will be apt to suffer; and if the Ground be miry, 'twill dye.

Five Bushels of *Siligo*, or of Wheat, is a proper Quantity for a *Roman* Acre, if the Ground be inclining to Chalk, and is moderately Moist; but if the Ground be dry and light, four Bushels is sufficient.

Poor Ground requires more Seed than rich Ground, because in poor Land, the Corn comes up with single Stems, but in strong rich Ground, we have many Stems growing upon one Root.

We must observe likewise, that a *Roman* Acre of Ground, which has Trees growing upon it, will not require so much Seed by a great deal to be sown upon it, as an open Field of the same Dimensions. Thus far have we been speaking of the Seed Time in Autumn, which we esteem to be the principal Season for sowing of Grain.

But there is another Seed Time, besides this, which in Case of Necessity helps the Farmers; this, they call the *Trimestre*, or three Months Harvest. This is generally practis'd in such Places as are expos'd to Frost and Snow, where the Summer is commonly moist; in such Places we must begin to sow time enough to finish our Work before the *Vernal Equinox*, which is about the 8th of the Kalends of *April*, according to the old *Roman Kalendar*, which compar'd with the English Account, is the 25th of March.

But

But if the Nature of the Place will allow, let us get this Work compleated before this Time; considering, that in this Case, the sooner we sow, the sooner we shall reap.

Some are of Opinion, that this Corn of three Months, would answer much better to be sown in Autumn, for that it cannot produce any valuable Crop in three Months Time; but this has been sufficiently experienc'd. The stronger Corns, indeed, should always be sown before Winter, in moderate Climates; tho' sometimes, we meet with Soils, that fling up such Salt and bitter Juices, that altho' we have sown our Grain at a proper Season, yet, is it so corrupted, by this noxious Moisture proceeding from the Ground, that many Parts of our Fields are unproductive, and appear without any Corn growing upon them.

These naked Places, should be particularly taken Notice off, that we may remedy this Evil at a proper Season; for when either by this Accident, or too much Wet, our Corn is destroy'd on such Places, we should lay Pidgeons Dung, or if that is not to be had, then we may manure it with Cypress Leaves, and plough them in. But the old Way, is to drain off the Water by Trenches or Gutters, without which the Remedies I have prescrib'd will be ineffectual.

Some will put two or three Bushels of Grain into the Skin of a *Hyæna*, and when they have lain there sometime, sow them, not at all doubting of a good Crop.

But there are also some subterraneous Causes, which destroy our Corn, chiefly by affecting their Roots; to prevent which, the Juice of the Plant, which the Country People call *Sedum* or Houseleek, mix'd with Water, is a good Remedy, if we steep our Corn in it, for about twelve Hours.

Some Farmers squeeze out the Muls of the *Cucumis Anguinus*, i. e. the long bowed Cucumber, and

and steeping the sliced Root in Water, steep their Corn therein, as directed in the foregoing Receipt, and then sow it. Others sprinkle their Corn Ridges with this Water, or with the Lees of Oyl; by which Means they destroy those noxious Vermin, which are Enemies to the Roots of the Corn.

We must likewise take Care to secure the best Seed for future Sowing, as soon as the Corn is cut down: For as *Celsus* observes, where our Corn is but indifferently large, we must pick out the largest Ears to be kept for Sowing; but when our Corn is generally large, we may sift it, and whatever falls about the Bottom of the Heap, from its extraordinary Weight and Largeness, should be laid by for Seed: For we observe, that Corn will degenerate as well in a dry Soil, as in a moist one; and if Care be not taken, a strong weighty Seed, may be impoverish'd, and produce poor Corn, as well as a weak one: But what is naturally poor when it is sown, can give us no Expectation of producing a rich Crop; as *Virgil* observes.

*Vidi lecta diu, & multo spectata labore,
Degenerare tamen; ni vis humana quotannis
Maxima quisque manu legeret: sic omnia fati
In pejus ruerè, ac retro sublapsa referri.*

Which *Mr. Dryden* gives us thus in *English*.

*Yet is not the Success for Years assur'd,
Tho' chosen is the Seed, and fully cur'd;
Unless the Farmer, with his annual Pain,
Renews his Choice, and culls the largest Grain.
Thus all below, whether by Nature's Curse
Or Fate's Decree, degenerate still to worse.*

Now there is no Doubt, but that a ruddy Grain, which is of the same Colour within as without, is good, and that which is Pale on the Outside, is
I generally

generally the same within, and is always light, and of little Worth. Let not therefore the Farmer set too much Value upon this pale Wheat; the *Siligo* is a white Corn, and brings a white Meal, but then it wants Weight to make it valuable. This Wheat we have been speaking of, thrives best in a moist Soil, and will bear more Wet than other Corn; we must also observe, that all Wheat, tho' it be of the very best, will lose its Colour, and become white after the third Sowing.

Next to the Wheat, we shall mention that Sort of *Ordeum* or Barley, which we name *Hordeum Cantabrinum*, or what the Country People call *Hexasticum*; for good Barley is more nourishing, both to Man and Beast, than bad Wheat; it should be sown in a light dry Soil, whether it be rich or poor, for it would spoil an indifferent Soil; for which Reason, it is either sown in a Soil too rich to be damag'd by it, or else, in such poor Ground, as is good for nothing else; if the Ground be open and fertile, we must sow it after the *Autumnal Equinox*; but if the Land be fat and heavy, we must sow it sooner; every Acre requiring five Bushels of Grain. When this Sort of Barley begins to ripen, it should be cut immediately, before any other Corn; otherwise, the Grain will soon drop, having but a slender Stalk, and being without Husks to support it; but for this Reason, is much easier to thresh than other Corn.

When we have carry'd in our Crop, it is advisable to lay the Ground fallow for a Year, unless we can spare a sufficient Quantity of Dung to recover its Strength.

There is another Sort of Barley, call'd by some *Ordeum Distichum*, and by others *Ordeum Galathicum*, which is very bright and weighty, and being mix'd with Wheat, makes an excellent
Family

Family Food ; it may be sown in a holding Land, in a cool Exposure about *March* ; but it will do better to be sown about the Ides of *January*, if the Season be mild. A *Roman* Acre will take up six Bushels of Seed of this Sort of Barley. We may sow among our Wheat, some *Panick* and *Millet* ; and I also allow the same Advantage to the *Legumen* or Pulse ; for there are many People who live upon such a Sort of Diet as this will produce.

The Pulse delight in an open light Soil, and thrive also very well in gravelly Grounds ; provided the Climate be moist, or the Soil not too dry ; and they do not like a dry or chalky Ground.

The best Time of sowing any Kind of Pulse, is in the Spring, for they thrive best in a warm Season ; about the later End of *March*, we may put them in the Ground.

Nor will the Expence of sowing the small Kinds of Pulse be very great, for about four *Roman* Sextaries of Seed is enough for a *Roman* Acre of Ground ; but they require frequently to be weeded, especially, when the Seed Pods begin to appear, and may be gather'd by Hand, as soon as we find the Seed full ripe, which is denoted by the Pods becoming dry, and losing their Verdure ; when our Crop has been thoroughly dry'd in the Sun, we may put it in the Barn.

Bread is sometimes made of Millet, which is agreeable enough, if it be eaten while it is hot.

Panick being well clear'd of its Husk, and also Millet being boyl'd, and eaten with Milk, is excellent Food.

I have here given my Reader a Piece of what is material in the Works of the *Roman* Writers of Husbandry, concerning the Quantity of Grain to be sown upon an Acre of Ground, as well as what they remark of the several Kinds of Soil, proper for each Grain. I shall now proceed to

give my Notes upon what they have recommended in this Chapter.

The first Thing I shall take notice of, is what *Columella* says, concerning the sowing a larger Quantity of Corn upon an Acre of poor Ground, than upon the same Quantity of rich Ground, which to many will seem a Paradox: For how is it possible, some will say, that poor Ground should nourish more Plants than rich Ground; but when we consider this, as we ought, we shall find there is good Reason for what the Ancients direct; for first, we must suppose, that Grain when it is sown upon such a Soil as it does not like, which is, what we must understand by poor Ground, then the Corn will make a weak Shoot, producing only a small Straw, and consequently, a weak Head or Ear of Corn, and therefore, one single Plant will stand in very little Room; but when we sow the same Sort of Grain in a rich Soil, that is, in such a Soil as it likes, every Root then will bring six, eight, ten, or more Stalks; and consequently, requires more Room to grow in, than perhaps, six of those weak Plants we have been speaking of. 'Tis therefore very rational, what is observ'd above by the *Roman* Writers, to sow more Seed in poor than in rich Ground; because, the surest Way to bring a Crop upon the poor Ground, that shall in some Measure be equivalent to that which grows upon the rich Ground, is to have as many Stalks and Ears upon one as the other, which can only be done, it may be, by sowing a Number of Seeds in Proportion. But it may be objected, perhaps, that such a superiour Number of Roots upon the poor Ground, will soon draw all the Nourishment from it, and the Plants must be starv'd, and that the Strength of the rich Ground, will nourish more Plants than we allow to be upon it. Here we must acknowledge, that certainly the Qualities in a rich Ground, will nourish

nourish more Plants than the Qualities in a poor Ground will do ; but then as the rich Ground will give Strength to the Plants that grow upon it, so Plants that are strong, will take up more Room, by their great Number of Stalks, than a Plant upon poor Ground, with its single Stalk, or at most a couple of them upon one Root ; and where a Plant is luxuriant, it draws its Nourishment much farther than a weak Plant can do ; and if the Plants in the rich Ground have not Room for the Stalks to breath a free Air, or to stand at proper Distances from one another, they will want that necessary Benefit, which all Plants draw from the Air, and grow faint and languid, so that their Heads will bring but little Fruit ; for from several Experiments I have made, I find every Plant draws almost as much Nourishment from the Air as from the Earth, and without Air it will dye.

The next Thing I shall observe from this Chapter, is. that the ancient Husbandmen direct us to sow about double the Quantity of *Adorem*, upon a *Roman* Acre, than we are to sow of Wheat ; what the *Adorem* is, I have explain'd in the Chapter of Wheat and Bread Corn, whereby it will appear, that what they call *Adorem*, is an husked Wheat ; and for which Reason, it is natural to suppose, that a Quantity of this Sort of Grain to sow an Acre with its Husks about it, will fill near twice as much Space, as a Proportion of naked Grain will do ; for the same Quantity of Ground, that is, a Bushel of Wheat clean'd of the Husk or Chaff, will sow twice as much Ground as a Bushel of Wheat with the Chaff about it ; for I suppose, the Wheat with the Chaff or Husk on, will fill near twice the Measure that it will do when the Chaff is separated from it : From whence it appears, the Advice they give us on this Account, is founded upon good Reason.

We are told in this Chapter, that the Hills bring a stronger Grain than the Vallies, but that they do not yield so much Corn in Proportion to the Quantity of Ground as the Vallies will do. If we consider what has been observ'd before, by the same Authors, that the hilly Grounds are always poor, and the Vallies rich; this may seem a Paradox to some People, and there will still be greater Difficulties to reconcile, if we read that Part of this Chapter, which says, that poor Ground will produce both weak Stalks and weaker Grain than the rich Ground: This seems to be a flat Contradiction, but I shall easily set this Matter to rights.

To explain this, I shall have Occasion first to mention, that a measur'd Acre of Ground upon the Side of an Hill, cannot contain near so great a Number of Plants of Corn upon it, as an Acre upon level Ground will contain, because, all Corn naturally grows upright; or if we suppose our Sides of the Hill with its Base, makes an equilateral Triangle, or near that Figure, as the Letter A, then both the Sides will just produce as much Corn as the Base upon a Plain, and no more; but this is fully explain'd in my monthly Writings of Husbandry and Gardening.

We are next to consider, that the Plants of Corn upon the Side of the Hills, must have their Heads rise one above another, according as the Hill itself rises, and consequently, have more Benefit from the Air, than if they were all growing close together upon a Flat; and again, every Root upon the Side of the Hill, must stand at a much greater Distance from the rest, than the Roots of Corn commonly do that is sown upon a Flat, and then every Plant has a greater Share of Ground to afford it Nourishment upon the Side of an Hill, than on the Plain; and the favourable Opportunity such Plants have of strengthening themselves

selves by the Air, empowers them to draw in what Nourishment is in the Ground about them, and so they have sufficient Opportunities of feeding and strengthening the Ears; besides, all the Corn growing upon the Sides of Hills, have the Benefit of being encourag'd by the fine Soil, which is wash'd from the higher Parts by Rains; which such Corn in a Body Arrest in its Passage to the Vale, and adds such an additional Strength to it, as Plants receive, when the Roots are assisted by fresh Earth, or are earth'd up as the Gardiners call it. This I think will suffice to satisfy us, how the Grain growing upon the Hills may be larger and more robust, than that growing upon the Plain; and from the Observation I have made at the Beginning of this Remark, concerning the Difference of Measure in the Hill, and in the level Ground, an Acre of hilly Ground, cannot produce near so much Wheat, as an Acre of Corn upon plain Ground; so that we have no Room to dispute the Veracity of the *Roman* Writers upon this Head.

We may next observe, the Provision the *Roman* Husbandmen made of Corn of every Sort, to sow at different Seasons; which I think our *English* Farmers might find their Account in, especially, since they may have the Grain of the Summer Wheat, and Summer Rye at a little Expence, from the South Parts of *France*, which would yield them a certain Crop, if the Winter Corn had been spoil'd, or to sow the Winter Barley, which may be had in the West of *England*, to make good the Deficiency of the Summer Crops of Barley, which sometimes fail; these would serve for good Changes for the Ground, the Wheat or Rye to follow the Winter Turneps, as well as those Turneps were the Successors of some Kinds of Pulse; so would not their Ground be worn out by a tedious Succession of Crops of the same Tribe, which is

the Fault of many Farmers; and besides, when Ground is kept continually in Use, as I mention, with proper Crops to succeed one another, it must consequently be render'd more free and open in its Parts, than it would be to lye fallow for a Year to bake and harden; for in the Way I mention, it must of Necessity be plough'd twice in a Year, and the Stubble and Offals of those Plants which grow upon it, will in every Respect enrich it, being full of vegetative Salts; but besides, we may yet reap more Advantage from these Summer Crops; for where we have Grounds which lye too cold for to carry any Winter Crop; yet, such cool Places are best for the Production of Summer Corn, as our Ancients observe; and it is no less necessary, that we take Notice, that we should always chuse our warmest Soil and Situation for our Winter Crops, as they recommend with good Reason. I also think with them, that if the Season be open about the End of *January*, we may then put in our Barley and other Summer Crops of Grain; for then we have before us, a reasonable Prospect of Rain, enough to strengthen our young Corn at its first coming out of the Ground, which sometimes, we are in want of, at our usual Time of sowing, and then our Barley is weak; but to sow early, the Ground is then full of Richness, which invigorates Plants; but the nearer we come to the Sun, as in the Months *March*, *April*, and *May*, so much more the Spirits of the Earth are exhal'd; and so our Seeds which are then sown, produce Plants weaker in Proportion: Many Instances of which we have in the Garden; as for Example, if we sow Cauliflowers, or Cabbages, or Cabbage Lettuce on the first of *February*, on the first of *March*, on the first of *April*, and so on the first of *May* and *June*; we shall find the Cauliflower Plants, that were sown in the the early Spring Months, as *February* and

and *March*, to be as strong again in both their Leaves and Flowers, as those that were sown in *April* and *May*; or those sown in *April* and *May*, much stronger than those sown in *June*; for the Air in the Spring has an agreeable Moisture in it, which is nourishing to Plants, and invigorates their Growth; but the Air of the Summer is dry, and is only useful to the ripening of Fruits; so that what we sow late in the Spring, cannot have the Growing Benefit of that Spring Air I speak of; and therefore cannot be so luxuriant in Growth, as those Plants we raise earlier in the Spring; or we may say, that the Plants late sown, are ripen'd before they are half grown: The Cabbages I mention, have the same Difference between them, that I find in the Cauliflowers, but generally, a worse Consequence attends the late sown Cabbages, for we find about one in five will run to Seed, without offering to make an Head; and the Cabbage Letuce likewise that are sown in Summer, will begin to run almost as soon as they are out of the Ground, altho' they were sown of the best Seed, without great Care to transplant and water them. So Barley, or whatever Grain we sow late, will bring its Seed before the Plant is half grown and nourish'd; and necessarily, the Grain must be poor and weak, as well as the Straw. But if any should object, that this early sowing would endanger the Corn, by Frosts that might happen whilst it was in its tender State; we may answer, that after *January*, it has not been known for many Years, and perhaps never, that we have had any holding Frosts; and for the frosty Evenings, which may come in *February*, I have not found that they injure Plants, which are much more tender than Barley; but however, if they should touch the Top of the Blade, it will do the Corn little Damage, while it is in its
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first Leaf, but rather set the Root to put out more Stalks, as the eating down of Corn with Cattle will do, and no such Frosts as I mention, are severe enough to hurt the Shank; so that I think we may receive Benefit by sowing of Barley earlier, than is the Custom with us.

But I come now to take Notice of what we find mention'd in this Chapter of Malign Juices in some Earths, which sometimes prevail so much as to poison the Plants that grow upon them, or else are so constantly possess'd of pernicious Moisture, as not to suffer any Seed to Germinate in them: To remedy this, *Columella* prescribes the Draining such Lands by Trenches, and laying Pidgeons Dung upon it, or *Cypress* Leaves, which I am apt to believe may do good, if the Water can be thoroughly carry'd off; but I think if we were to burn this Ground, as they do in *Devonshire*, or as *Virgil* and the other *Roman* Writers recommend in some other Cases, it would be a surer Means of discharging those Salt and Bitter Juices, than any other Way we could take; or if that would not do, to try it with some Plant, which we might find out, that would agree with it; for it is certain, there is no Soil whatever but has some favourite Plant that will prosper in it.

After this, we are told of subterraneous Causes which spoil our Corn; by these I suppose are meant such Insects as work in the Ground, and crop the Roots, for the Preparations they prescribe of Oyl Lees will certainly destroy Insects; and I suppose the Juices of these Herbs they mention, *viz.* the *Sedum* and the *Cucumis Anguineus*, being mix'd with Water, may do the like; or as we practice in some Places in *England*, upon such Occasions, to steep Tobacco Stalks in Water, and water the Ground with that Preparation, will fully answer the End as well; but Tobacco was not known to the *Romans*. I have often thought of what great Use
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it would be to the Gardiners about *London*, if the great Quantities of damag'd Tobacco, which is condemn'd every Year to the Furnace, could be first infus'd in Pits of Water, for the watering their blighted Crops, or that some Tincture might be drawn from it, to mix with Water, for the Destruction of Insects that infest Plants; for we find such Preparations are infallible in such Cases; and besides the Power the Tobacco has of destroying the Caterpillar; some of its Salts will be communicated to the Earth, and thereby be helpful to it.

The *Sedum* or Houseleek, which is here mention'd, I cannot find out; for *Columella* tells us, 'tis a Plant which the Country People call *Sedum*, and we have so many Varieties of *Sedums*, that without a fuller Account of it, we might leave it as we found it; only, thus far, I believe most of the *Sedums* we know, are pretty near the same Virtue, as most Plants are, that are of the same Tribe.

But the *Cucumis Anguinus* we can give some better Account of, so far as to direct my Reader to a Cut of it in *Perkinsons Herbal*; and that 'tis there call'd *Cucumis Anguinus flexuosus*, or the long bow'd Cucumber; but we have no Description of it.

The next Observation, worthy our Notice, is the Choise of Seed, which is a main Article, and ought to be carefully consider'd by all Husbandmen; for there is as much Reason to believe, that a large Grain will bring a large Plant, as there is, that a large Kind of Cattle will bring large Cattle; however, this depends also upon the Nourishment, such Grain, and such Cattle receives; for if either of them was to be stinted in the first Time of their Growth, they would never recover it; but always be in a Sort of languishing State, and their Offspring still
would

would grow weaker and weaker by Degrees; so that in three or four Generations, they would be so much degenerated, as hardly to be trac'd to their first Originals; and then 'tis in my Opinion, impossible ever to bring back such a degenerated Breed, to the Perfections of their Progenitors, tho' we were to allow many Generations for it; as *Columella*, observes, when he says, that 'we' cannot expect a rich Crop from such Grain as is naturally poor, when it is put into the Ground; but one may reasonably expect good Corn, if we put good Grain into such Ground as will afford it sufficient Nourishment. However, it is observable, that Seeds of any kind will degenerate in three or four Sowings, if they are not directly shifted from one Soil to another; for which Reason, it is commonly practis'd among the Gardiners, to change Seeds with one another, every Year or two, which we find answers the desir'd End. What my Authors tell us concerning Wheat, which is of a ruddy Colour, becoming white after a third Sowing, is no more than we may allow: But when some of the Ancients say, that Wheat will in Time degenerate, so much as to become a Plant of a quite different Tribe; I confess, this is above my Capacity of understanding.

We come next to the *Roman* Method of sowing of Panick and Millet among their Wheat; but this, I doubt, will hardly be follow'd by our *English* Husbandmen; for if we have Ground that will bear Wheat, why should we encumber it with either Millet or Panick, which are trifling Grains in Comparison of Wheat; the Wheat that might grow in its Room, will surely turn to much better Profit. However, that we may understand clearly every Thing the *Roman* Writers of Husbandry dictate to us, let us see what Proportion of these small Grains, or Pulse, as they call them, is allow'd to an Acre.

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They tell us about four *Roman* Sextaries, is sufficient for a *Roman* Acre. The *Roman* Sextary, is a Measure containing, according to some, about a Pint and half, or eighteen or twenty Ounces; but by others is said to contain twenty four Ounces, which is two Pounds *Troy* Weight, or a Pound and half *Avoirdupois*, which is an *English* Quart; which Measure it commonly passes for among the Learned.

Thus have I endeavour'd to give my Reader the necessary Remarks upon this Chapter. I shall now proceed to lay down, some other Prescriptions of the Ancients, concerning the Choice of Land for *Legumen* or Pulse.



C H A P. XI.

Concerning Soils proper for Pulse, from Columella, &c. with Remarks.

E come now to treat of Pulse, of which, I reckon the Lupine is the best, because it requires little Care, and turns to great Use; besides, they are cheap, and are great Improvers of Ground; the Lupine cut to Pieces, is an excellent Manure for poor Vines, and enriches Land extreamly; there is no Ground so poor, but it will grow in it; and it will keep in the Granary a whole Age: This being boyl'd, and well soak'd in the Winter Season, is excellent Food for Oxen. In Years, when Corn is scarce, this is always at Hand, and that Seed may be us'd presently after it is thrash'd: We may sow it in *September*, or about the Calends of *October*; for
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it desires the mild Autumn Season, to strengthen it before the Winter Frosts come on.

The Seed which we design to preserve, must be kept very dry; for otherwise, it will be apt to breed Maggots, which destroy the Germe of the Seed, and entirely prevent its growing; this particularly loves a reddish Soil, not much caring for a chalky or moist Ground. A *Roman* Acre will take up ten Bushels of Seed, to crop it as it should be.

The *Phaselus* or *Pasolus* is next to this, and may be sown either in Ground that has lain fallow for a Year, or else in a fat Soil, that has been sown with Corn, the Year before. A *Roman* Acre will take up four Bushels of this Seed.

Pease love an open free Soil, and a warm Exposure, where they may partake of a moderate Moisture. An Acre of Ground will require four Bushels of Pease to crop it; but some allow no more than three Bushels. We begin our first sowing of Pease about the autumnal *Æquinox*.

The Bean requires a fat Soil, well dung'd, or such Land as has lain fallow for a Year, and has been in the Way of the Washings of the Hills. We must take care in the sowing of this Pulse, that the Seed is covered deep enough; for it is absolutely necessary, that the Bean be well cover'd with Earth. A *Roman* Acre of Ground will take up twenty four Load of Dung.

If our Ground be raw and cold, whereon you are to sow your Beans, plough the Ground well, and harrow in the Seed; tho' some tell us, 'tis better to plough them in, in such a Soil; because, say they, the large Clods of Earth, defend not only the Seed from Injuries of Weather, but defend the young Plants also from the Frosts. Some are of Opinion, that this Method of Sowing the Bean, will answer our Purpose, as well as if we were to dung the Ground; which may be thus understood,

stood, that tho' the Bean cannot, perhaps, be said to enrich the Ground; yet it does not rob the Earth so much of its Nourishment, as other Seeds will do: For I am perswaded, that Corn will prosper very well upon such Ground as had nothing growing upon it the preceeding Year but Beans.

Tremelius allows four Bushels of Beans, to sow a *Roman* Acre of Ground; but *Columella* allows six Bushels to the same Quantity of Ground, if it be a rich Soil; but if not, then we may sow a little more upon a *Roman* Acre.

The Bean does not love a lean Soil, nor to be expos'd to too much Heat, or too much Cold; a middle State of Air, and good holding Land is best for it.

We have two Seasons of sowing the Bean, one is the Middle, and the other is at the End of what is call'd the *Septimunciales*. We chuse to sow at different Seasons, least one of them should fail; for sometimes our first Sowing, yields the best Crop, and sometimes the last Sowing has the Advantage. This Pulse, altho' it is a Crop of three Months, does not thrive well, if it be sown in the Spring; for if we sow it in *February*, the Plants indeed grow large and vigorous, but they yield few Beans, and are of small Advantage: So that all the old Farmers agree, they turn to much better Account, to sow them as Winter Crops than when we venture them too far in the Summer Heats.

Virgil, and the ancient Farmers advise us, to macerate our Beans in a Preparation of Niter and Lees of Oyl; for such Beans as are thus prepar'd, will not be infested with Insects.

When our Beans are full ripe, let them be pull'd up, and when they are well dry'd and cool'd, they may be carry'd into the Barn.

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The Lentil may be sown at two Seasons; one is in the Middle of the Seed Time, appointed for Winter Crops, and the other at the later End of *February*. It will do well either in an open light Soil, or in strong Land; but if the Ground be too rich, it is not good for it; but yet, before we sow Lentils, if our Ground be stiff, we may bring some dry Dung upon the Land, and spread upon it after it has lain in Heaps four or five Days: This Culture will help to forward the Growth of our *Lentills*. We allow somewhat more than a Bushel of Seed to sow a *Roman Acre*.

When we have gather'd our *Lentills*, we must presently clean them from their Hulks; for they are very apt to be destroy'd by Insects, while they are in the Pods, and after they are well clean'd, we must put them in Water, in Order to separate the good from the bad Seed; for it is a certain Rule, that the sound Seeds will sink to the Bottom of the Water, and the imperfect or bad Seeds, will always swim at the Top. When we have thus discover'd what Seed is proper for our Use, let it be well dry'd in the Sun, rubbing it with the Root of *Silphium*, and steeping it a little in Vinegar; then dry it carefully again in the Sun, and when it is cool, lay it in a dry Barn, if you have large Quantities of it, or else, put it in such Vessels as we use for Oyl, or Salt-Fish, that are well glaz'd or plaister'd, and our *Lentills* will keep a long Time; but if we have not these Conveniences for keeping them, we may mix them with Wood-Ashes, and preserve them that Way.

Linseed, should not be sown but in large Quantities, or unless we are tempted to it by the great Price it bears at the Market; for it is very pernicious to Land. It requires a fat Soil, moderately moist.

This Linseed or Flax is to be sown from the Kalends of *October*, till the setting of *Aquila*, which
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is the seventh of the Ides of *December*. A *Roman* Acre will require eight Bushels of Seed.

'Tis the Advice of some Husbandmen, to sow our Flax very thick upon a poor Soil, for that they say, will make the Stalks of the Flax the smaller and finer, wherein consists the Goodness of Flax. We may likewise sow Flax in *February*, in a rich Soil; every *Roman* Acre then requiring ten Bushels of Seed.

The *Sesamum*, being a Plant which requires some Moisture, is to be sown from the Autumnal *Æquinox*, to the Ides of *October*. The Ground most proper for it, is a black open Soil; but yet it will thrive very well in a gravelly Soil. The Quantity of Seed for a *Roman* Acre should be the same as of Milet, or Panick; but some will allow two Sextaries more for an Acre. When I was in *Cilicia* and *Syria*, I have seen this Seed sown in *June* and *July*, and cut down in Autumn; being then full ripe.

The *Cicers*, or Chich Pease should be sown in *January* and *February* in rich Ground, and in a moist Soil; but in some of the warmer Parts of *Italy*, it is sown about the Calends of *November*. Three Bushel of Seed serves a *Roman* Acre. There is not any Kind of Pulse which does the Ground less Injury than this; but it is not very constant in its Crop, for if it happens to be dry Weather when it is in Flower, it generally fails. The *Cicer Arietinum*, which differs from that I have named before, call'd *Columbinum*, and another Sort which is call'd *Punicum*, may be sown any Time in *March* in a rich Ground if the Weather be moist. These are apt to be spoil'd in a dry Season like the other; but if you have a Mind to venture them, let the Seed be first steep'd before you sow it, and it will come up the sooner. Three Bushels are enough to sow a *Roman* Acre.

Hemp requires a fat Soil, well dung'd and water'd, lying low and moist; the Ground should be well plough'd; six Corns of this Seed is enough for a Foot Square of Ground, and should be sown upon the Rising of *Arcturus*; which is about the End of *February*, i.e. the Fifth or Sixth of the Kalends of *March*, or it will be too late to sow it till the Vernal *Æquinox*, if the Season be wet.

While we are speaking of Pulse, we ought not to neglect the Turnip, and the Rape; for the Farmers cultivate large Quantities of both, which are very useful, both as a Food to Mankind, and also for feeding of Oxen; especially in *France*, where the Rape serves as a Winter Food for their Flocks. Both these require a light loose Soil, and will not thrive in a strong Land: The Rape chuses an open moist Soil, and the Turnip a low dry Ground, not too rich, but prospers best in a sandy Soil. The Quality of some Soils will make both these degenerate in about two Years Time: The Rape into a Turnip, and the Turnip into a Rape. In moist Grounds these are best sown about the Solstice; but in a dry Soil we should sow them the latter End of *August*, or Beginning of *September*: The Soil should be often plough'd, and the Clods broken. This is of great Consequence not only because these Plants thrive better for it, but the Ground brings a better Crop of Corn after the Turnips or Rapes are off the Ground; a *Roman* Acre requires about four Sextaries of Rape Seed, or five Sextaries of Turnip Seed, and not more, because if we sow them too thick, their Roots will not apple.

I come now to offer my Remarks upon this Chapter, and first I shall take Notice of what is there observed of the Lupine for the Improvement of Ground. I have already given some Account of it in a former Chapter, but shall here take Occasion to reason a little further upon it. For
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the manuring of Land, and for enriching the Ground about the Roots of Vines especially, the Stalks of this Plant is highly commended to be cut to Pieces, and dug or plough'd into the Ground, before the Plant be dry'd : We are to understand, that the Stalks of the Lupine are full of viscous Juices, and must therefore be useful to a light sandy Soil, in binding its Parts ; and besides I have found that all viscous Bodies contribute greatly to the Growth of Plants and to Vines chiefly, as I have try'd ; nor will the Stalks of the Lupines when they are dry, be wanting of the viscous Quality : I speak, when their Parts come to be moisten'd ; altho' there will be no Appearance of such Quality in the dry Stalk. The Berries of the Mistletoe will by drying, become so hard, that there will be no Sign left of its viscous Quality, but being steep'd in Water, will soon recover it as well as any other Body of that Nature will do after it has been dry'd. By this binding Quality this Plant therefore seems to answer the End of Clay, which I recommend for the Improvement of sandy Land ; for Clay has likewise a considerable Viscosity in it, which mixing itself by Degrees with the Sand, will keep its Parts together in such a Manner, as to make it hold Moisture enough in it to support the Plants that grow upon it, which without such a binding Quality would too frequently want Water. But, indeed, the Lupine being full of vegetable Salts, is still more nourishing than the Clay ; and in every Particular that I have yet examin'd, must needs be highly profitable for Land if it be light ; and it is principally recommended as a Manure for Vines, because the same Writers direct a light sandy Soil for those Plants ; and I find this by Experience, that our soft green Soap will forward their Growth as well as their Bearing, to be laid about their Roots ; but the Ground where I try'd the Experiments,

were sandy, like that recommended by the *Roman* Writers; but whether they would bear the Application of Soap to their Roots, if they happen'd to be planted in a Clay or other stiff viscous Soil, I cannot determine; but I am apt to believe, that Soap in such a Case would do no great Good; however, the Stalks of the Lupine can do no Harm in such Ground as this, because in Time they would consume, and by that Means help to open the Parts of the stiff Soil, besides furnishing it with vegetative Salts. But besides this good Quality of the Lupine, we are taught that the Stalks are of long Durance in the Barn for the Use of Oxen and Kine, by being steep'd a little in Water before they are used, and 'tis allow'd by all, that a Slipperyness in any Food, is a sure Token of its nourishing Quality, as a Dryness is a Mark of the contrary. Again, we are inform'd, that the very Seed is to be eaten by Mankind, in the Way of Pultage, after it has been steep'd some Time in Water, to take out the Bitterness; which is still another Vertue of the Plant that cannot be suffer'd to pass by neglected: And then when we consider, that this valuable Plant requires little Trouble in its Culture, and a poor Ground to grow in, which perhaps will bear nothing else: I cannot help wishing that some of our idle Lands might be enrich'd by it; and I can so far vouch for it, that it will grow in those sandy Lands which we reckon the worst of all, as Heath Grounds, and such like, which now are accounted in a manner useless.

The next Remark I shall make upon this Chapter; relates to the sowing of the Lupine rather before Winter than in Spring. I find by many of the Ancients, that they preferred this Season for sowing before any other in the whole Year, if their Crops would bear the Winter. Now, it is to be remark'd, that the Lupine is an annual Plant, as Wheat is, and it is a Maxim, that whatever annual
Plant

Plant will stand the Winter, must be sown, so as not to blossom before that Season, or even to attempt it, but if we take Care to sow at such a Season in Autumn, as our Plants may gather some Strength only to defend them from Frosts, we may expect a plentiful Crop the Summer following; for I have try'd most Kinds of Annuals that are cultivated in the Garden this Way, and they bring almost double the Crop of Seed that those did which were sown in the Spring, and the Winter-Plants were almost twice as big as the Spring Plants: But the Lupine indeed, I cannot promise will stand the Winter in *England*, tho' all the ancient Writers tell us, it will do in *Italy*; as for *Virgil*, he certainly writ Part of his *Georgics* about *Mantua*, and the others at or about *Naples*, which makes a good deal of Difference in Point of Climate; and had he not been as good a Judge of Nature, as he was excellent for his Poetry, I should have been apt to think that one Part of his Husbandry was calculated for *Mantua*, and the other for *Naples*; and then there must inevitably be some Confusion among the foreign Farmers who follow'd his Dictates.

Mr. *Dryden* tells us in his *Life of Virgil*, that a great Part of his *Georgics* seem to have been rough drawn before he left *Mantua*; for an ancient Writer has observ'd that the Rules of Husbandry laid down in it, are better calculated for the Soil of *Mantua*, than for the more sunny Climate of *Naples*, near which Place, and in *Sicily*, he finish'd it.

And *Rusæus* in his Account of *Virgil's* Life, tells, *Annis V. C. 717. Dum adversus S. Pompeium Octavianus bellum instaurat: orditur Virgilius Mæcenatis suavis Georgica quæ septem annis consequentibus exequitur, maxima ex parte Neapoli.*

What is observ'd by Mr. *Dryden* concerning *Virgil's* laying the Design of the *Georgics*, or even writing some of them about the *Mantuan* Side of *Italy*,

Italy, seems highly probable from *Virgil's* Praises of that Part of *Italy* in his second *Georgic*, where he mentions the River *Clitumnus* as one of the Beauties and Wonders of the Country he describes, which was the Country of the *Falisci*, now a Part of *Tuscany*. the Latitude of which is about 43 Degrees 20 Minutes North Latitude. While the Latitude of *Naples* is 40 Degrees and 56 Minutes; so that there is Difference of Latitude between one Place and the other, two Degrees and 24 Minutes, or an 144 Miles, which *Naples* is more South than the Part of *Tuscany*; I reckon from or about the same Difference of Latitude that there is between *London* and *Tork*, which is enough to vary the Spring above a Fortnight between the two Places, or to make the Spring earlier by fifteen Days at *Naples*, than it could be about the Country of the *Falisci*, as it is likewise between *London* and *Tork*.

But there is no better judging of these Things, than by examining the Temper of Air at both Places; and that is always best known from the Culture of Plants coming from Places which are some Degrees nearer the Sun than the Places we have in Dispute, as *Naples*, and *Tuscany*; for Example, which tho' there are Orange-Trees growing in both these Places, yet those in *Tuscany* are forced to be preserv'd in Winter under Cover, while those about *Naples* thrive without any Shelter at all.

But besides the Advantages which *Naples* has over the Part of *Tuscany* I mention, which is much the same Latitude as *Mantua*, there are two other Things which concur to make the Climate of *Naples* warmer by about 10 Degrees than *Mantua*: The First is, the Nearness of the Sea to *Naples*, would alone give it 15 Days Advantage in the Spring of *Mantua*, which lies Inland; an Instance of which we have in the South Parts of *England*, where I find that the Places near the Sea Shore
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are above a Fortnight earlier in the blooming of Trees, and in the Production of their Crops, than those Places which are only 30 Miles more North in the Country. And again, what is still contributing as much to the Heat of the Country, about *Naples*, is the burning Mountain *Vesuvius*, and the Mines of Sulphur, which are continually burning under Ground, by which Means the Earth as it were becomes a hot Bed, capable of supporting Plants which are Natives of the warmer Climates, all the Year about, without any Shelter. In this Part of *Italy* it is common to have Pease, and other such Things all the Year round; and their Fruit for the most Part ripen two Crops a Year. The Sugar Canes, which are natural to the hottest Islands between the Tropics, grow in this Climate with great Freedom: And in fine, there is no Reason to doubt that any Plant almost of the warmest Latitude, would miscarry in this Part of the Country: But on the other Hand, about *Mantua*, the Frosts are so severe, that the Vines and the Olives are often destroy'd by them. In this Case we are to consider, that *Mantua* lies within the Influence of the *Alps*, which breath a sharp piercing Air from the Snows which lie continually upon them, and in an especial Manner are destructive to Plants when such Snows begin to melt; which happens commonly about the Time when the Vines and Olives are in their tender Shoot. What I say here of the Snows beginning to melt, means, that Snow, which lies towards the lower Parts of the *Alps*; but upon other Parts the Snow remains all the Year. By this Disadvantage, the Places near the *Alps*, may be esteem'd no forwarder in their Spring, than if they lay two Degrees more to the Northward, in an open plain Country. The Rules which *Virgil* lays down for the Husbandman, are in great Measure the same as those given us by *Varro*, *Cato*, *Hesiod*, *Columella*, &c. as far as they

hey relate to the Times and Seasons of sowing, he like them also observes the rising and setting of the Constellations; and the Time of the Moon to a few Hours, must be observ'd for the gathering and putting the Crops into the Ground: This, they all take so much Pains to inculcate in the Minds of their Readers, that it would seem by them that an Husbandman might be sure of every thing he undertook. But yet we may gather from their Works, that sometimes these Signs fail them, and upon the setting of such a Constellation, there will be either a South Wind, or a West Wind, or dry Weather; or sometimes wet Weather, which shews their Portents are not infallible: So that these Remarks of theirs are not so much to be regarded in particular, as in Sum; from whence we may have a general Sketch of the Weather at the several Seasons in the Countries they liv'd in; unless indeed, that the rising and setting of the several Constellations may serve to direct the Times for the several Works in Husbandry, to those who understand Astronomy, as well as certain Days appointed in every Month, will serve to direct such Husbandmen as do not understand the Motions of the Stars.

But altho' it appears from *Virgil's* mentioning the River *Clitumnus* (whose Waters are said to make the Cattle white that drink of it) which waters the upper Part of *Italy*, that his Husbandry was calculated for the *Mantuan* Side; yet the Lines which soon follow, tell us of such Things as are not to be met within any Country less warm than *Naples*;

Hic ver assiduum, atque alienis mensibus æstas.

Bis gravida pecudes, bis pomis utilis arbor.

which may be thus understood; that the Place he speaks of, has either Spring or Summer in every Month throughout the Year. In a Word, they know

know no Winter, their Flocks breed twice, and their Fruit Trees produce their Fruit, as often within the Compass of twelve Months. These Lines I suppose, were added after *Virgil* had left *Mantua*. For they certainly relate to the *Neapolitan* Side: However, our Husbandmen are to take Notice what Plants are mentioned by them to be tender, that is, what they are which they recommend to be sown Time enough to gather Strength before the cold Rains or Frosts begin, and those in particular must have a Share of our warmest Seasons. *Virgil* has led me as far as *Naples*, and I have offered some Reasons why that Country is so much hotter than about *Mantua*, altho' 'tis but a little more than two Degrees more South. I shall beg my Readers Patience a little longer, while I offer some Thoughts concerning the Cause of those subterraneous Fires which prevail so much on the *Neapolitan* Territories. For to explain this, may be of considerable Use to those who have Coal Mines, by shewing them the Danger of opening them too near the Sea, and shew us the Use of such natural hot Beds.

Mr. *Tournfort*, in his Voyage to the *Levant*, gives us an Account of some considerable subterraneous Fires in the Isle of *Milo*, and gives us so rational an Account of them, that is no less curious than useful, and may explain to us the Cause of all others, wherever they are found.

He tells us, that the Island of *Milo* is almost an entire hollow Rock, spongy, and as one may say, soak'd with Salt Water; the Iron Mines which are there found, maintain perpetual Fires: The following Experiments seem to demonstrate, that this Metal is the chief Cause of subterranean Fires. A Principle, which well evinc'd, will help to explain the Production of several Minerals.

Filings of Iron, steep'd in common Water, will grow considerably warm, and much more so in
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Sea Water; and if we add to it Powder of Sulphur, the Mixture will really burn some Time after 'tis put together.

It is therefore probable, that the Fires which are constant in this Island, are solely occasion'd by a ferruginous Matter and Sulphur, which no Part of the Island is without; these Materials are heated by being drench'd with Sea Water; for as we coasted about the Island, we discover'd Multitudes of subterraneous Mouths, through which the Sea Water ingurgitates; and by Means whereof, the Sea Salt is convey'd into the minutest Cavities of this spongy Rock.

'Tis very likely, this Salt undergoes much the same Process of that, which we put into our Retorts; that is to say, the Fire which continually burns in the Bowels of this Island, causes an acid Spirit to separate from this Salt; which Spirit is not unlike that, which we draw from Sea Salt, by common Fire.

To the aforesaid acid, must be referr'd the Production of Alum and Sulphur, which are the commonest Minerals in *Milo*; for this Liquor penetrating insensibly the hardest Rocks, dissolves them, and incorporates with them, and so is converted into Alum.

We can hardly dispute this, since it is evident, that if we pour Spirit of Salt upon common Stones, or upon Chalk, aluminous Concretions are produc'd; and the same acid Spirit, mixing with the Brimstone, that pervades the Veins of the Earth, occasions the Formation of Sulphur.

Every one agrees, that Sulphur is only a fat Substance, fix'd by an acid Spirit. The Sulphur which is artificially made, and the Analysis of common Sulphur, put this out of all Dispute.

The Sea Water is not only Salt, but bitter, and fat; for what can become of that vast Quantity of Oyl, which must be deposited in it by
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the Fish, which are continually corrupting. No wonder the Sea appears so often in a Flame, when it is agitated by Tempests. It may be, that this fat assists in the Composition of Brimstone, of which the common Sulphur is made; and this may be the Reason of Sulphurs being commonly found in Places lying near the Sea, where Earthquakes are frequent.

Such are the famous *Vulcanoes*, *Vesuvius*, *Stromboli*, *Mount Ætna*, the burning Mountains of *Fayal*, the Pike of *Teneriffe*, besides some others on the Coasts of *America*.

But to return to the Isle of *Milo*, it certainly abounds with all the necessary Materials, for the Production of Alum and Sulphur; but as for Niter, there is none at all.

The Sulphur of *Milo* is very beautiful, having a greenish shining Cast, which made the Ancients prefer it to that of *Italy*; it is found in this Island, in large Pieces, when they dig up the Ground.

If the other Islands of the *Archipelago*, are without these Sorts of Minerals; it is, because their interior Structure does not favour the Introduction of the Sea Water into the Hollows of the Rocks, or because they contain no ferruginous Particles.

Thus is the Island of *Milo*, a natural Laboratory, wherein is continually preparing Spirit of Salt, Alum, and Sulphur, by Means of the Sea Water, Iron and Rocks; and by the singular Structure of the Interior of the Island, which is so fram'd as to strain the Saline, and fat Parts of the Sea Water. These Parts are put in Motion by the violent Burnings, excited Day and Night by the Iron and Sulphur; which Burnings, being produc'd by the Spirit of Salt, give Birth to the Alum and Sulphur. 'Tis observable, that this spongy cavernous Rock, on which *Milo* is founded, is a Sort of Stove, gently warming the Earth, and
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causing it to bring the best Grapes and Figs ; and most delicious Mellons in all the *Archipelago*.

The Juices of this Soil are admirable : The Fields here are never at rest, or lye fallow, but Crops of different Kinds are continually succeeding one another. Thus far of subterraneous Fires, and the Cause of them, as well about *Naples* as elsewhere ; for about *Visuvius* are found all the Materials above mention'd, with which the Sea Water concurring, we have that natural hot Bed, which helps to render that Country equal in Point of Climate, to the hotter Parts of the World, lying between the Tropics.

We are next to observe in the Chapter I am now descanting upon, the Quantity of the *Faselus*, or *Pbaselus*, which is to be sown upon a *Roman* Acre, which may partly determine the Size of the Grain which was call'd *Pbaselus*. *Columella* allows four Bushels for an Acre, which would be a great deal too much, if the Seed was very small, as some of the *Greeks* intimate : And then again, he says, that three Bushels of Pease will serve an Acre ; the Reason is, because the Pease of the *Romans* were smaller than the Seed of the *Pbaselus*, which seems to inform us, that the *Pbaselus* were much about the same Bigness of the smaller Kinds of Kidney - Beans, which are cultivated with us.

We are likewise advis'd, to harrow in our common Beans in cold Land, which I think was rational enough, and to be prefer'd before ploughing them into Land of a chilly Nature ; for such Land is commonly annoy'd with Springs, which would be apt to rot the Seeds, or the Roots of the Beans, if they were bury'd too deep ; therefore I think, to sow them shallow in such Soil is wholesome Advice ; however, as our Way is in *England*, to plant our Beans with a Dibble in Rows ; and we find that Way to be of good Use, especially in
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the gathering our Beans green, without hurting the Plants ; I shall not insist upon the *Roman* Way of sowing them, unless it be when we design them only to Thrash for Seed : But however, we may take this by way of Caution from the *Romans*, that whether we sow them or plant them, we must always observe to let the Seed lie more shallow in cold stiff Ground, than in light warm Land ; which we must also observe with our Pease when we sow them. I observe from the Manner the Ancients sow'd their Beans and Pease, without Order, that 'tis likely they never gather'd them Green, as we do ; for the gathering them would, as they were sown, have bruised and destroy'd the Plants.

The Bean, says the ancient Writers, does no harm to the Ground, but rather improves it for Corn ; the Reason of which is, that the Roots of the Bean strikes downright, and reaches deep in the Ground, from whence it draws its Nourishment ; the extreme Parts of the Roots commonly reaching about five Inches deep, while the Roots of Corn, which are fibrous, seldom reach deeper than three Inches ; but some will say, perhaps, that therefore the Beans just draw their Nourishment from that Part of the Ground ; which, when it comes to be plough'd for Corn, will lie uppermost, where the Roots of the Corn are to feed themselves, or draw their Nourishment. The Ground by this ploughing, as well as by the Growth of the Bean-roots in it, has its Parts open'd, so as to be capable of distributing its Juices with more Freedom than it could before ; and besides, as I have observ'd in another Place, the several Roots of Plants are so form'd, that every one according to its Texture of Parts, and Frame and Figure of its Vessels, is render'd capable of receiving only such and such Juices, as their several Frames can admit of : Some are so made, that they

they will only receive the more Oily Juices of the Earth, others only the more watery Juices; some again delight in collecting the more acid Juices, others those which are Bitter, or Salt, or more enclining to Sweetness, and so on; and then if one Plant happens to succeed another Plant, which has fed upon such Juices of the Earth as were natural to the succeeding Plant, then we may depend upon a poor Crop; but if our Ground has been cropt, suppose with such a Sort of Plant as had drawn its Nourishment from the Bitter Juices, then any Plant will prosper upon that Ground which feeds upon Juices of a contrary Nature; and one may partly guess at this from the Make of Plants, for I suppose all Plants which have the same kind of Make and Mode of Growth, draw from the Earth in some degree or other the same Sort of Juices; and the nearer they resemble one another, in their Make, and Figure, and Size, so they perhaps, according to those Proportions, draw certain Quantities of those Juices. Now in the Case before us of sowing Corn after Beans, in the first Place, tho' the Earth which nourish'd the Roots of the Beans, is turned up; yet it is so mix'd with the Earth which was the Surface, and had rested while the Beans grew upon it, that it in a Manner does the Office that fresh Earth would do, if we were to bring it upon the Ground; and secondly, the Root of the Bean being a long Root, and the Root of the Corn being a fibrous Root, the Corn cannot draw the same Sort of Nourishment from the Earth as was receiv'd by the Bean; and if the Figures and Modes of Plants are any ways concern'd in the Affair, then the Bean and the Corn must have their Nourishments vastly different from one another: for there are scarce any two Plants more unlike in every Part than the Bean and Corn. *Virgil* seems to have had a Regard to this Piece of Philosophy, when he recommends
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the Changing of Seeds, as I have mention'd in my Notes upon the foregoing Chapters.

We are advis'd to sow Part of our Beans at the Time which is call'd *Septinuncialis*, which is the Season when the *Agonalia* are kept, which is a Wake or Feast upon the Seven Hills of Rome, about the fourth of the Ides of *December*.

The Bean, say our Writers, if it be sown in Spring, will indeed perfect its Crop in three Months; but then the Halm or Stalks of the Beans will grow so luxuriant, that they bear but few Cods. Where this Luxuriance happens in the Growth of some Plants of the annual Race, it is common to find them bare of Fruit; for then they are fill'd with watery undigested Juices, which over-power the prolifick Quality, but such Plants as are over and above luxuriant and vigorous in Growth, if they are of such Sorts as are lasting many Years, a due Time will settle their Juices, by discharging their too abundant Moisture; but annual Plants, where our Expectations depend upon the Seed only, has not Time to settle their Juices, if they happen to be over-charged with them before they make an attempt to Blossom, and then this Luxuriance is apt to fling off the greatest Share of their Blossoms. To help this, I generally, when I see Beans ramp too much, cut 'em down before they shew their Blossoms, within four Inches of the Ground, and they will then fling out fresh Shoots, which will appear weak, but will reward your Labour with a great Quantity of Fruit, if they have a moist Season, or are well water'd; either of which will keep them from the black Fly, which is very injurious to the Bean.

The Macerating of Seeds in Lees of Oyl and Niter, is also recommended in this Chapter; the Oyl especially seems to be rational enough, for that all Seeds are more or less Oily, and the Parts
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of which they are composed are therefore more apt to receive a Benefit from Oyl than from Niter, if the Oyl has that Quality which is natural to the Seed which we steep in it; for we may observe from what I have said before, that if a Plant which delights in the sweeter Juices of the Earth, should be planted in a Soil which abounds in bitter Juices, the Plant must certainly perish for want of Nourishment, or else be poison'd by feeding upon Juices contrary to its Nature, if its Parts can any ways be made to receive them, and sometimes Force or Necessity will overcome Nature. Now where we meet with such an Oyl as is a proper *Pabulum* for the Plant we want to cultivate, then we may hope for Success: In the Choice of such a Preparation, we may consider two Things; the first is, that it should be of such a Nature as it may tend to the Preservation of the Seed from Putrefaction; and the next is, that it contain such Principles as are agreeable or natural to the Seed. For the Preservation of the Seed, we find that nothing is so salutary as Oyl, and that it may contain such Principles as are agreeable to the Plant we design to Cultivate. One may imagine, that an Oyl drawn from a Plant of the same Sort, will surely contain such Qualities as may be helpful to the Seed: Now if our Preparation be watery, then the Seed would be as subject to rot as the Oyl would contribute to its Preservation; and if our Preparation be Oily, and has not the Principles in it which the Seed requires, then it would in some Sort prevent Nature in the making the Seed sprout and thrive, at least the Seed would have no Encouragement from it; for in this Case, where the Seed is to take its first Stamp from a Thing disagreeable to its Nature, we must reasonably conceive very little Hopes of its ever coming to good: It is imposing upon the Genius of a Plant, and whatever Attempt tends to the over-

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turning of a Genius in any Thing, is the surest Way to destroy it.

If there could be discover'd such a Preparation as might be in all Respects agreeable to one Sort of Seed, there would be a fair Prospect of finding out somewhat which might be agreeable to another: As the Principles of every Plant is in the Seed, would not that be a proper Index to point us out the proper Food for it, if the Texture and Properties of the Seed were well examin'd? I think that would be the surest and readiest Way to Perfection. I acknowledge, however, that every Seed or Plant will extract what they can from the Body they are set in for their Nourishment; but if what they require happens to be blended with Poisons, or Things that are contrary to its Nature, which is all one, they will never prosper afterward; or may we not judge from the Taste or Flavour of the Juices of a Plant, distributed in the Leaves, Wood and Flowers, what may be a proper *Pabulum* for it: To be nice, I say, one might drive at Particulars, but the small Advance which People have made in this Way of Thinking, has only yet given us some general Hints upon this Head, as Oyl by the Ancients. Viscous Matter I have found to be useful, and the Ruins of any Vegetable is allow'd by all to be so; as it contains a great Share of Vegetative Salts. If I have not been lucky enough in this Note to hit upon a Liquid, particularly proper to the Bean, yet I hope I have dropt some Hints which the ingenious may improve not only for the help of this, but of every other Sort of Seed and Plant; for without reasoning in the *Rosicrusian* Way, I am perswaded there is such a Thing as a Body, which contains every Principle of Vegetation in it, and enough of each Sort to forward the Growth of any Sort of Plant, whose Seed is put into it.

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I have already try'd one Preparation with a large Variety of Plants, and find it hitherto to succeed beyond my Expectation; when I have thoroughly experienc'd it, I shall then communicate it to the World, as I have done all the rest of my Discoveries

The Ancients tell us, that the steeping of Seeds in the Lees of Oyl mixt with Niter, will keep the very Seeds they are to produce free from Vermin, that is; from Insects; and then one may have the same Hopes that the Plants themselves may be free from the black Fly, or other Insects that annoy them, which have been steep'd in such a Preparation; and there is one Thing more which I may observe, that such a steeping of the Seeds, if it has the Influence they speak of, is nourishing to the Plant; for if it was not, the Plant would surely be infested with Insects, for they never do Mischief but when a Plant is not in a vigorous State of Health; I mean the smaller kind of Insects, not the Caterpillar.

The *Lentill*, or what is call'd *Till* in *Hampshire* and *Wiltshire*, is of that Nature, that the *Roman* Writers of Husbandry tell us, if it has not Rain while it is in Flower, we lose all hopes of a good Crop of Seed from it. This seems, in some Measure, to contradict my System of the Generation of Plants; for in my Observations, I chuse a dry Time, when the Trees are in Blossom, for the better setting of the Fruit; because if Rain should fall upon the Blossoms when they were fresh open'd, and the *Male Dust*, or *Farina fecundans* was in its full Spirit, the Wet would dull that Powder, and make its Parts stick so close together, that it could not be convey'd by the Air or the Springs in the *Apices* to the *Pistellum*, or Stile of the Fruit, without which the Fruit cannot Set; but in the Case of the *Lentill* we are safe as to that Point from the Make of the Blossom, which so encloses the *Apices*
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which bring the *Male Dust*, that no Rain can come at them; and these Parts being thus secured from Rain, the Refreshment which the Ground will receive from Showers, will certainly encourage the Growth of the Plant, and the young Fruit likewise; for oftentimes we find, that after Fruit is Set it will drop, if the Weather be extremely dry.

But the *Lentill*, besides the Use of the Seed, is used as a Fodder for Cattle, and therefore must certainly receive great Benefit from Summer Rains, which help its Growth, and encrease its Quantity; so that perhaps a Parcel of Land sown with this Pulse, which will yield six Loads of Fodder in a dry Season, will, if the Season be moist, bring nine Loads, which is a considerable Difference.

We are also inform'd in this Chapter, that the Seed of the *Lentill* is very apt to be eaten by Insects, even while it is in the Husk; so that before we use it we should separate the good Seed from the bad, by throwing it into Water, the bad Seed will swim at the Top. This is what I generally do to try most of the larger Seeds, which are the most subject to decay, especially the Ever-green, Oak Acorns, or the Seeds of such Plants as are always to remain in the Places where we sow them, and then we have a fair Chance of having our Seminary regular and equal, if we can keep them from the Mice, or such like Vermin.

When our *Lentills* are thus distinguish'd, we are directed to wash them with Vinegar, and rub them with the Root of *Silphium*, and then dry them in the Sun, to be afterwards kept in glazed Vessels. The Vinegar here seems chiefly designed for the Destruction of the Eggs of any Insects, that may by Chance be among the Seeds, as well as to preserve the Grain for the Time to come from Insects; for it is a common Practice among the Gatherers of the Kermes to sprinkle it with Vinegar,

by which they find the Insects, or little Flies which make it, are destroy'd; but without this Care the Places they lay it in after it is first gather'd, will be fill'd with small Flies which hatch from Eggs, which are contain'd in it; and it would be worth trying, whether Vinegar is not destructive to all Insects of the smaller Sort; for if so, it might help our Trees, in Case of Blights, without injuring the Tree, for there is no Vinegar, that I know of, but what is made of the Fruits of Vegetables; and therefore I suppose it cannot hurt a Plant.

The Plant *Silphium*, which is mention'd in this Chapter, was very much used by the Ancients, and highly esteem'd by them for the grateful Flavour it gave to several Meats they prepared with it. This is one of the *Lasserworts*, or what is call'd *Laserpitium Antiquorum*, by *Dioscorides*, who describes it thus: It grows, says he, in *Syria*, *Armenia*, *Media*, and *Lybia*, with a Ferulous, or Fennel-like Stalk; the Leaves like the *Apium* or Parsley; and the Seeds broad; the *Lasar* is the Juice taken from the Root, and from the Stalk by scarifying them. The best is, that which is somewhat red, transparent, like unto Myrrhé, and not green, of a strong Scent and sweet Taste, which being moisten'd with Water, presently becomes white. If any Taste the *Cyrenian* Sort, it will move all the Humours of the Body to a Sweat, with a moist sweet Scent; so that the Breath of those who have only eaten a little of it, will smell agreeably: That of *Media* and *Scyria* is not so forcible or good, and is not so pleasant in its Flavour as the other. All these are adulterated with *Sagapen*, or Bean-flower, before they are dry'd, which deceit may be discover'd by the Taste, by the Smell, by the Sight, or by the washing it with Water. Some give the Name *Silphium* only to the Stalk, calling the Root *Magydaris*, and the Leaves *Maspetum*; the most effectual is the Root, the next are
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the Leaves, and last of all the Stalk. Thus far *Dioscorides*, but *Theophrastus* and *Pliny* give very large Accounts of it; but I shall only mention some of their more particular Observations relating to it: The Seed is broad, and spread like a Leaf, for which Reason it is call'd *Folium*; it is as yellow as Gold, the Stalk is annual like that of Fennel; the Flesh of the Cattle that feed upon it is very savory to the Taste; the Stalk is eaten by Men, either boyl'd or dress'd otherways: It grows wild by Nature, and will not bear transplanting, says our Authors, tho' I believe they are mistaken; for the Roots, altho' they come to be very large and long, like those of Fennel, yet I suppose they will bear removing from Place to Place, if they are transplanted while they have no Leaves upon them, or after the Stalk withers; for Fennel is safely transplanted, when it is in that State. By these Accounts it seems as if it was not unlike the Plant Sellary, which is now so much in Request: But to proceed, *Pliny* says, that in his Time it was not to be had but for its Weight in Silver, and that it was so much destroy'd that only one Branch of it was brought to the Emperor Nero, of all that could be found in his Time: He also tells us, that it grows plentifully upon Mount Parnassus. I do not find any other Names given it than *Silphium* and *Laserpitium*; nor have we any Account which seems to signify that it may be cultivated, in Opposition to what *Pliny* says; but what we have from *Alpinus*, who says, that it was growing in the Garden belonging to Cardinal Bembo, and afterwards in that of the Musaros. There is one Sort of it found about *Marseilles* in France, as *Lobel* says in his *Adversaria*, which *Roit-deletius* tells us comes the nearest to the true one of any that he had seen.

Scrapius speaking of the *Laserpitium* of the Greeks, tells us, *Laser* is known to the *Indians*, and is of two

Sorts, one of which is shining and clear, like to *Electrum*, of a strong Scent and great Price, which is brought, as it is thought, from *Guzaratte*, *Pattane*, *Mandou*, *Cbitor*, and *Dely*, which is a cold Country, and extending to *Chervam*: The other Sort, he tells us, is not so bright, and does not afford so strong a Scent. This, he says, was brought from *Corasone* to *Oimus* in *Persia*, and from thence was carried to *Pegu*, *Malaca*, *Tavesiris* and the Countries next adjoyning. The *Banians* of *Cambaya*, who were in Times past esteem'd great Philosophers, and are now Merchants, buy this *Laser* according to their Ability, and put it into their Broths and Salads, first rubbing their Vessels with it, and use no other Sauce with their Meats, it being agreeable to them both in Taste and Smell; nor does it breed any loathing in those who are not accustomed to it. The Taste of it is at first somewhat bitter, as pickled Olives are; but being chewed a little while, is very pleasant.

The Sort which is the least pure, is bought by the ordinary Sort of People. being of a much smaller Price than the good Sort. The *Banians*, who are the chief Dealers in this Commodity, have a Method of cleaning this impure Sort, and will not suffer it to be used till it has been cured by their Skill. Thus far *Serapio*.

As to the Virtues of it, *Dioscorides* gives us a very long Account; in which he intimates, that it is an Antidote against most Poisons: It cures the Bitings of Mad Dogs, if it be apply'd to the Wounds, and also the Venom of any other Creature, or envenom'd Darts or Arrows: If it be either drank, or outwardly apply'd, it cureth the Wounds of Scorpions. He relates many other Things which this Herb is good for, in the Cure of Distempers subject to human Bodies, which would be tedious to relate; I shall therefore content myself with setting down these, as Reasons, perhaps

perhaps why it was of such extraordinary Value among the Ancients. Some suppose this Plant to be the *Benzoin* which produces the sweet Gum, call'd *Assa dulcis*; but that is a Mistake, for the *Benzoin* is the Gum of a great Tree in the *East-Indies*.

The next Remark we may make upon this Chapter, is the Method the ancient Writers prescribe, of preserving the Seeds of the *Lentill* in Ashes, that is, in Wood Ashes; which I have experienc'd to be an excellent Preserver of Fruits, and is much the best Thing we know to pack tender Fruit in for Transportation; it not only will keep such soft Fruits, as Peaches, Nectarines, Abricots, &c. from bruising in the Carriage, but keep their fleshy Parts from Putrefaction. The late Lord Capel, who was so famous for his fine Gardens at *Kew Green*, by this Means had Fruit sent him from this Place to *Ireland* in very good Perfection. The Method of doing which was to gather the Fruit when it was quite dry, and after laying it in Flannels for some Hours, a Box was prepared for it with a Bed of fine sifted Wood-Ashes at the Bottom, about four Inches thick, upon which the Fruit was laid so as not to touch one another by about an Inch, and then Wood-Ashes sifted over them till all the Spaces between them were fill'd, and the Fruit was cover'd about two Inches; then more Fruit was laid in as before, and then more Ashes, and so on, *stratum super stratum*, till the Fruit reach'd within four Inches of the Top of the Box, and then as many Ashes sifted over it as could be press'd down under the Lid of the Box by a Man's full Strength; so was it carry'd several hundred Miles without receiving the least Injury. The Fineness of the Parts of these Ashes, render them in the first Place capable of being press'd so very close together, that there can no Air get through them; nor are their Parts such

as are apt to imbibe Moisture, and are therefore incapable of Putrifaction; for we may keep them many Years without perceiving them to Alter or Change, from what they were when they were first made, and are not only without any putrifying Quality in themselves, but seem also to contain some Power which is opposite to Putrifaction, and therefore we never find any Insects breed among them; for this Reason I am apt to believe, that Wood-Ashes would be the best Thing we could use to bring Seeds in from foreign Parts, as the *East* and *West-Indies*; for in long Voyages we find most Seeds incline to rot and breed Insects; but this Way, I believe, will keep them sound, especially since the Ancients affirm, that the *Lentills*, which are subject to corrupt, may be preserved by em.

I come in the next Place to enlarge a little upon what our Authors say concerning the sowing the Lint or Flax-seed pretty thick, that the Flax may be the finer. It is certainly very necessary, that every Farmer should be well apprized of every Use the Plant may be put to which he is about to cultivate, that he may direct his Work in such a Manner as may bring himself most Profit. We find the Flax is most valuable that is produced of Plants which have their Vessels small and fine, which always happens when the Plants are weak, and are grown up pretty tall by standing close together; but in our Crops for Fodder or for Seed, if our Plants stand too close, then we shall be losers by the Weakness of the Plants. Now when we sow Flax upon strong Ground, the Stalks of our Flax will be strong and large, if they do not stand very close together; and if they are at too great a Distance from one another, then they will be short in their Stalks, but the Seed will be the better for it; then these strong Stalks when they come to be dress'd, will yield very coarse Flax
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from the too great Nourishment of the Earth, which the Sap Vessels receiv'd, and which Vessels, when they come to be separated from the Parenchymous Parts, which held them together, is the Flax which is to be spun for Thread, or for Cloth; if therefore these Vessels are large and luxuriant, it will be impossible ever to spin a fine Thread from them: But to have such Flax as will spin to a fine Thread, we must contrive in the Culture of it, to avoid giving it too much Nourishment, that our Plants be rather weak than strong, and that the Stalks be long, which is done by chusing our Ground, rather poor than rich, and sowing our Seed so thick, that the Plants may grow as near together as possible, so will they prevent one another from gathering Nourishment from the Air, and run up to a good Height in such slender Stalks as we desire: In my Notes upon a former Chapter, I have given my Thoughts concerning the Advantage which every Plant receives from the Air, as well as from the Earth, to help its Growth. And as the Flax is most valuable, which will produce the finest Thread, so is Hemp likewise; but as the Hemp naturally brings a much larger Plant than the Flax; so of Necessity, we must allow it much more Room, as our Authors have directed; but the nearer the Plants grow to one another, if they are not too close, so much the finer will the Vessels be, which we make our Hemp of for spinning; and consequently will be more valuable.

The next Thing I shall take Notice of, is, what our Writers observe of the Rape or Turnep, and the *Napus*, or *Navew*, which as well as the Hemp and Flax, they rank among the Pulses, which shews that they were no extraordinary Methodists in Botany, and their Names too of Plants, are sometimes so much out of the Way, that one hardly knows how to trace them; and 'tis for this Reason

Reason, I suppose, we have had so much Confusion among the Translators of them, and especially where any of them speak of Inoculating or Grafting; we have such unnatural Matches made between the Stock and the Scions, as has given Room to the Readers of the Translations, to suspect either the Judgment, or the Veracity of the ancient Writers, or else to blame the Infidelity of the Translators. I wish I may have better Luck in what I am about; I shall endeavour to support every Thing I set down, with the best Reasons I can, after I have given the Opinions of those who have written in the best Way, upon the Subjects I shall have to handle.

The Turnep, however, by the Description they give of it, and its Uses seems to be the same, which we now cultivate in *England*, with a round Root, to so good Advantage, both for the Food of Man, and as a Fodder for Cattle in the Winter; and what I account to be none of its least Perfections, is the Improvement this Root is of to sandy Soil, by enriching it with its Juices, so that it shall become fit for producing of Corn. A Plant which has been so long known for these Perfections; besides, the short Time it takes to be upon the Ground, one would have thought, might have made its Way as far as *England*, many hundred Years ago; especially, since in *Columella's* Time, it was a Favourite in *Gallia* or *France*; but yet the Culture of it for Cattle, has been so much overlook'd, that I am told, it has not been apply'd to that Use with us, above twenty Years, and even that has been only in a few Parts of our Country; but within this last five or six Years, I hope my Writings have help'd to introduce it in many Places in *England*; for I find that 'tis now almost generally known, and propagated by our Farmers.

Our Authors give us a very necessary Caution, concerning the sowing of the Turnep, that we do
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not sow it too thick; for if we should, say they, the Roots will be small, and will rarely come to Apple as they ought to do. From this Remark of theirs, it seems as if they were not us'd to hough their Turneps; which is the Method in *England*, to set them at a proper Distance from one another, so that the Roots may become large; but where this is neglected, we find the Ancients very right in their Judgment; our Turneps will run all into Leaf, and by keeping the Air from the Roots, we shall lose the chief Benefit of our Design, which principally depends upon the Largeness of the Roots, altho' our Kine feed upon the Leaves, but our Sheep chiefly admire the Roots; for which Reason, I have known some Farmers mow their Turneps, about a Load of Leaves at a Time for their Kine, and have left the Roots for the Sheep whom they folded upon them, allowing them as much Room as possible.

With the Rape or Turnep, they likewise recommend the *Napus* or *Navew*, which Names have been strangely confounded by the Botanick Writers, one being often taken for the other. The Greeks call the *Napus* βένις *i. e.* *Bunias* Significatione a tumente radicis figura deducta, from the Swelling of the Root, sed *Rapis* hoc nomen magis competere videtur, but the Turnep much rather is agreeable to this Name, quam γογγόλις; but *Galen* makes no Difference between *Buniadas* and *Gongylidas*; and indeed there is very little but in the Form and Greatness of the Root, and somewhat in the Sweetness. *Pliny* would make five Sorts of the *Napus*, but he mistakes the Word ραφανίς, or *Raphanus* for *Napus*; taking it very likely from *Theophrastus*, who maketh four Sorts τῶν ραφανίδων *Raphanorum* Radishes, not *Naporum*. But Mr. *Tournefort*, and other Botanists of late Date, makes *Rapa* to be the Turnep which we find thus nam'd, *Rapa Sativa, rotunda, radice, Candida*. C. B. Round Garden

Garden Turnep with a white Root, *Rapum Sativum Rotundum*, J. B. This Turnep has large Leaves spreading upon the Ground, which somewhat resemble the Leaves of the red Colwort in Shape, but are of a dark green Colour, rough and jagged on both Sides to the very middle Rib. The Flowers are yellow, the Seeds are redish and round, very like Colwort Seed; the Root sometimes swells to a very large Substance, which in the Garden Phrase is appleing of the Root, sending down a small Fibre to draw in Nourishment; this Root is firm and succulent. The Stalk of this Plant rises to the Height of four or five Foot; the upper Leaves are oblong, smooth and of a grayish Colour, ending in sharp Points, but broad at the Bottom, embracing the Stalk. The Flowers are made like those of the common *Charlock*, set upon long, slender and smooth Footstalks; they are succeeded by taper Pods, divided into two Cells, which are parted by a thin Membrane, and containing a double Row of round Seeds. Mr. Tournefort says *Napus* or *Navem* is the Genus of a Plant, which differs from the Turnep, only in that particular Make and Appearance, which easily distinguishes it to the Gardiners and Husbandmen; wherefore, says he, we may if we please, reduce it to the same Genus. The *Napus* or *Navem* we speak of is call'd *Napus Sativa*, *radice alba*, C. B. and is the $\beta\epsilon\tau\iota\alpha\varsigma$ of the Greeks; it rises with a Stalk a Foot and half high, hollow with many Wings; the Leaves are without Footstalks, and embrace the Stalks and Branches, the lower Leaves are deeply cut, but the upper ones are plain and pointed at the Ends. *Lobel* tells us they are not so rugged as Turnep Leaves, the Flowers are yellow, like those of the Turnep, and the Seed also is like that, and contain'd in long Pods; the Root is likewise resembling the Turnep Root, but not swelling so much, or making so large an Apple,

Apple, this shooting deeper into the Earth, and is of a compact fleshy Substance, and commonly white, but there are some Sorts which have yellow Roots. *Lobel* says, the Root of this is sweeter than that of the long Turnep; but I cannot see, but that one may properly call this the long Turnep, since there is no considerable Difference but in the Shape of the Root; these are cultivated in great Plenty about *Montpelier*, but do not grow wild. Thus have I concluded my Remarks upon this Chapter of what the Ancients call Pulse; I shall now proceed to give the Opinion of the *Roman* Writers of Husbandry, concerning the several Sorts of Fodder for Cattle.



C H A P. XII.

Of the several Sorts of Fodder for Cattle, from Columella, and others of the Roman Writers of Husbandry; with Remarks.



HERE are several Sorts of Fodder for Cattle, as *Medica*, Vetches, the Fodder of Barley and of Oats, *Fænugreek*, and also the *Ervum*, and the Cich Pea; besides these, there are some Sorts of Fodder of less Note, which are seldom cultivated; the *Cytissus* excepted, which is of great Value, but of that I shall speak by and by, when I treat of Browse for Cattle.

The Fodder which has the first Place in this Chapter, as the most deserving of any other, is the *Medica*, or Medick Clover, which will hold in good Strength upon Land for ten Years after 'tis sown, and will bear Cutting sometimes four, and sometimes six Times in a Year; it is a great Enricher

richer of Land, and is an extraordinary Fattener of Cattle, and is so nourishing, that a *Roman Acre* of it will feed three Horses for a whole Year.

When we are about to cultivate this Plant, we must first break up our Ground about the Kalends of *October*, and let it lye to mellow all the Winter; than plough it again carefully about the Kalends of *February*, clearing the Ground of all the Stones, and breaking the Clods as fine as may be. About *March* we are to give it a third Plowing, and harrow it well; then we must lay it out in Beds of ten Foot wide, and fifty Foot long, leaving Alleys between them for the Conveyance of Water to them in dry Seasons; and that they may be free on all Sides for Weeders to work, when there is Occasion. After this, spread some old Dung upon the Beds, and sow the Seed about the End of *April*, in such a Proportion, that a single *Cyathus* of Seed, shall cover a Piece of Ground, ten Foot long, and five Foot broad; which being done, let your Seed be presently raked in with wooden Rakes; for if the Seed is not presently cover'd, the Sun will damage it. When we have done Sowing, the Ground must not be touch'd with any Iron Tool; altho' we must take care to destroy all Weeds that appear amongst our *Medica* while it is young; for then it is apt to receive Damage, by Weeds growing among it.

It is likewise to be observ'd, that we must by no Means attempt to cut any of it, till it has began to seed; after which, we may mow it as soon as we please, and give it to our Horses.

When we first give them this Fodder, we must dispence it to them in small Quantities, least it should not agree with them; for too much of it at a Time, till they are a little used to it, will be apt to swell them, and breed too much Blood.

After mowing this Crop, we should water it often, and weed it carefully a few Days after it
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has began to spring : With this Management, we may cut it six Times in a Year, and it will remain good for ten Years.

There are two Seasons for sowing of Vetches ; the first is about the autumnal *Æquinox*, if we design them for Fodder, then allowing seven Bushels of Seed for a *Roman Acre*. The second Time of Sowing is in *January*, or somewhat later when we design them to stand for Seed ; we then allow only six Bushels of Seeds for a *Roman Acre*. At both these Seasons of Sowing, you may either sow your Seed upon Land unplough'd, or upon Ground that has been broken up, but the last is the best ; however, we are to observe, that this Sort of Seed must not be touch'd by Dews, for they are hurtful to it ; therefore we should not sow sooner than eight or nine a-Clock in the Morning, when the Sun or Wind has dry'd the Ground ; at the same Time, taking Care that we sow no more than may be cover'd or plough'd in the same Day, and that too, before the Evening Dews begin to fall, for they will certainly spoil the Seed. We must also observe not to sow it before the five and twentieth Day of the Moon, for otherwise it is remark'd that it is hurt by Snai's.

When we sow Corn for Fodder, we should sow it in a cultivated Ground that has been well dung'd. For this Use we should sow the *Ordeum Cantherinum*, or six row'd Barley about the autumnal *Æquinox*, allowing ten Bushels of Grain to a *Roman Acre*. For this Design, we should chuse a moist Season, that the Grain may spring apace, and grow strong before the Severity of the Winter comes on, then will it be fit for Oxen and other Cattle, when there is a Scarcity of other Fodder. This will serve to feed our Cattle till the Month of *May*, if we design it for no other Use ; but if we sow it with a Prospect of reaping a Crop of Grain, besides the using it as Fodder, then we must draw off our Cattle

Cattle from it by the Kalends of *March*, and let it then remain unmolested for Seed bearing: The same we may also do with Oats, if they are sown in Autumn, they may partly be cut as Fodder, and serve too, to bring a Crop of Grain.

The *Pænugreek* which the Rusticks call *Siliqua*, has two sowing Seasons; the first in *September*, when we sow it for Fodder, *i.e.* at the same Time we sow our Vetches, about the autumnal *Æquinox*; and the other Time of sowing it is about the End of *January*, or Beginning of *February*, if we design it to stand for Seed. If we sow it for Fodder, we allow seven Bushels of Seeds for a *Roman Acre*; and if we sow it to stand for Seed, we allow but six Bushels to the same Quantity of Ground: Both these Sowings should be made upon unplough'd Ground, but Care must be taken, that when we plough in the Seed, our Plough should not go deeper than the Thickness of four Fingers, for else, the Seed will not rise kindly, or perhaps not at all; for which Reason, some Farmers open the Ground before they sow with very small Ploughs, and when they have laid the Seed, cover it with Rakes.

The *Ervum* or *Orobus*, call'd in *English* the bitter Vetch, thrives best in poor Ground, not over moist; for a too rich Ground kills it; it has two sowing Seasons, the first is in Autumn, the other in *January*, or all *February*, but by no Means in *March*; for the Farmers say, that if it be sown in that Month, it has an ill Effect upon the Cattle that feed upon it, the Oxen chiefly are made giddy by eating of it. One *Roman Acre* requires five Bushels of Seed.

In that Part of *Spain* call'd *Batica*, the *Cicer* is cut, and gently bruis'd, and being then macerated in a little Water, becomes soft, and is given to Oxen in lieu of the *Orobus*. It is likewise mix'd with Chaff, and given to other Cattle.

Twelve Pounds of the Seed of *Orobys*, or bitter Vetch is sufficient to sow a *Roman Acre*, and sixteen Pounds of *Cicers*, or *Ciche Pease*: It is neither unpleasant, nor unuseful to Mankind, being much like to the *Cicerula* or *Lathyrus* in Taste, tho' a little differing in the Colour, which is tending to black; it is sown in *March*, either deeper or shallower, as the Richness of the Soil requires. Thus far our Authors concerning the several Sorts of Fodder for Cattle, in Use among the *Roman Husbandmen*, I shall now offer some proper Remarks, upon what is here laid down, for the better explaining of the several Particulars.

My Reader will find an Account of the *Medica*, *Vetch*, *Fœnugreek*, and the *Ervum*, what they are in my Notes upon the Chapter of Pulse, to which I think proper to refer him, rather than be guilty of Tautology; but as to the Methods which are here directed for their Culture, it will be necessary to reason a little upon them.

The *Medica* or medick Claver, we are told, if a single *Roman Acre* of it be well manag'd, it will feed three Horses all the Year about, for it may be cut sometimes four, and sometimes six Times in a Year; at this Rate of reckoning, if we allow two Shillings per Week for the Fodder of each Horse, then our Acre will produce of Fodder to the Value of fifteen Pounds twelve Shillings a Year, which when the Expence of cutting it for the Horses, and all other Care and Labour is taken out of that Sum, there may well enough remain fourteen Pounds per *Annum* Profit; for, I think, my Allowance for Work and Care, which is one Pound twelve Shillings per *Annum*, is as much as it will come to; and then allowing twenty Shillings more for the Rent of the Ground, we shall have remaining, clear Profit, thirteen Pounds per *Annum* to the Farmer, which we may expect with some Certainty, this being a Crop which is not
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subject to be hurt by Summer Showers, or beat down by Hail, or spoil'd by Tempests; and besides, it occasions as little Trouble as any Crop; for all the Labour here, in a manner, is to reap the Profits of it. We must take Notice, that the Horses are not to feed upon it in the Field, which appears by two Things; the first, from the manner of disposing the Ground in Beds, encompass'd with Trenches; or deep Alleys for Watering it; and in the next Place, from what is said of the Cutting it, sometimes four, and sometimes six Times a Year, which could not be done, if Cattle were ever suffer'd to graze upon it. I am oblig'd even to Explain this as I have done, because some Country Men, who I have mentioned this to, could not be satisfy'd, whether the Horses were not to Graze upon it, or to have it cut for them; and therefore there may be others also who may be as ignorant.

The Method of laying out this Ground for *Medick Claver*, or indeed any other Sort of *Claver*, I admire extremely; for, I don't know any Way so good for watering such a Crop, to Advantage, as this is; I suppose it to be level Ground, with a Head of Water near it, the Beds encompass'd with Trenches, or Alleys, to hold Water as long as we think proper, to be, as I imagine, commanded by Sluices, which may let it on or off at Pleasure; the Breadth and length of the Beds is such, that the Water being once let into the Alleys, may feed the Roots of the *Claver* quite through each Bed, without injuring the *Herbage*, by lying upon it, which is very often the Case in Watering of Fields; for besides the Glutting, or almost Suffocating the *Herb* with Water, which is too thick a *Medium* for it to breath in, if I may so call it, it is apt to be scorch'd and burnt, by the Sun's coming too suddenly upon it, after the Water is gone off; but when the Earth alone is refresh'd
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by the Water, the Sun then exhales it by Degrees, from the Earth, and the moist Particles in that Exhalation, which moves among the Shoots and Leaves of the Plants, are imbib'd by the spongy Parts of them, and nourish them as they require, and the Plants become strong and vigorous; for it is not enough to feed the Roots only of Plants with Water, unless the Air about them can be rendred somewhat moist at the same Time; for if the Season be very hot, and dry, the Shoots of Plants are then shrunk into a narrower Compass than they are in moist Weather, and the Vessels are so much pinch'd and constrained, that they cannot suffer the Juices to pass freely, which are taken in by the Roots; but if the Air is moisten'd, as well as the Earth, then all the Parts of the Shoots will be in a proper Condition to receive Benefit from their Roots: It is a certain Rule, that whatever Plant has its Leaves, or Shoots, abound naturally with Water, will the soonest rot in Water, and as the *Clavers*, of all Kinds, have juicy Stalks, so they would soon be damaged by it, while another Plant, which is less succulent, will not suffer so much, and an Herb, which has its Leaves as thin as Grass, will not easily receive Damage from it; but however, this is to be observed, by the by, that all Plants which grow naturally upon the Land, are help'd and strengthen'd by the Air, and will, in Time, grow sickly, if they are confin'd to keep their Residence in the Waters; and on the contrary, such Plants as naturally have their Residence in the Waters, cannot subsist if they are brought into a Medium so thin as the Air; others there are which will not subsist upon dry Land, nor in the Waters, altogether; but must live in Earth continually moist, as in Boggs; and again, there are some whose Roots never take hold of the Ground, but only strike their *Fibres* into the Water,

and swim from Place to Place ; and then again we have such as never appear but in the colder Seasons, as the *Mosses*, &c. While, on the other Hand, the hottest Weather of our Summers, is hardly sufficient to keep some Plants alive : How necessary is it then to consider the Soil, Temper of Air, Situation and Quantity of Water proper for every Plant we cultivate, that every one may have its Share of Benefits which was created for it; and when this is rightly considered, we shall then find our Nursery thrive and prosper to our Advantage.

I conceive that the Alleys are about six Inches deep, and about two Foot wide; and if any should think this is wasting of Ground, let him only consider which he would rather chuse, a full Acre of this *Clower*, that might be cut three times a Year, or one of this Sort, that will bring five or six Crops; he will find, that an Acre of Ground, manag'd this way, will considerably exceed the other in Value.

We are next to explain what that Measure is which the Romans called *Cyathus*; which Measure of the *Miedick* Seed, they say, is enough to sow a Piece of Ground ten Foot long, and five Foot broad; the *Cyathus* contains four Spoonfuls; so that one of the Beds of ten Foot wide, and fifty Foot long, will take up ten of this Measure full of Seed.

The Advice of *Columella*, to rake in the Seed as soon as 'tis sown, is very necessary to be observed in the sowing of all Crops, that is, the burying of the Seed, whether with the Harrow, with the Plow, or with the Rake; for if we leave our Seed spread, and uncover'd, in the Field, so as to lie in that State a whole Night, the Birds will certainly have a good Share of it; and besides, it will be subject to suffer by the Dews, which always rise in great Quantity at both our sowing Seasons;
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some Seeds indeed are more apt to be injured by Dews, than others; that is, where Seeds are of that Sort as are thinly coated, and whose *Germe* is large; in this Case the Dews are apt to make an immediate Impression upon the Seed, and occasion its *Germe* to begin its Growth; or else, if the two Lobes of the Seed happens to be very Spongy, and contains watery Juices, then the Lobes will imbibe the Moisture of the Dews, and by their swelling, will put the *Germe*, which they inclose, into a Vegetative Motion; which Motion, being once began, must be continued without Interruption, or else the Seed will die: And now, I suppose, in those Seeds which have lain a whole Night abroad, the Dews have that Effect upon them, that I speak of; and before we can plow them in the next Day, the Heat of the Sun will dry them, and pinch their beginning Growth, so that they will hardly come to good; now when the Seed is at once put into the Ground, then it is not subject to these Changes; but as soon as it is bury'd, begins to move, and by continuing its Growth, without Interruption, comes to be a healthful Plant. I don't doubt, but I shall have many object against what I say, because of the common Practice of steeping of Corn: But they must observe, that the Seed of *Corn* is of a quite different Nature from that of *Pulse*, or almost of any other Seed; for *Corn*, such as *Wheat*, *Rye*, *Barly*, *Oats*. &c. has no Lobes, or Ear-leaves in the Seed; so that they are not subject to be injured by wet, as some others, and especially all of the *Pulse* Kind, which immediately begin to swell with the least Moisture; and when they once begin to work, must be kept moving, or else nothing comes of them; I had some tryal of this kind this Year, with the *Kidney Bean*, at a Garden at *Vaux-Hall*, which I have in Partnership with some others; my Design was to find out the De-

gree of Heat required chiefly for the *Kidney Bean*, and to endeavour to bring it up as hardy as I could; I therefore try'd it in several Degrees of Heat in *January*, one in a common Hot-bed, with Glasses; others upon an Hot-bed, with no other Covering than Bass-mats; and a third Parcel in the Frames, where I rais'd the forward *Plums*, *Cherries*, *Grapes*, &c. In this last Frame I sow'd some of the *Kidney Beans*, within six Inches of the Boards, against the back of which was the warm Dung; and another Row about two Foot and a half from the warm Boards: Those in the Hot-bed cover'd with Glasses came up very well; as did also those within six Inches of the warm Boards: But those which came up on the Hot-bed cover'd only with Mats, and the others, which were sown at two Foot and a half distance from the warm Boards of the Fruit Frame, a few of them came up, but very weakly; which, as soon as I perceived, I took them up, and transplanted them into warmer Places, as well as those Seeds which had not yet began to show their first Roots; and though I did this with the greatest Caution that could be, so that they were not out of the Ground a fourth part of a Minute, yet none of them came to any thing; so small a Check will destroy a Seed of this Kind, when it has once began to swell for Germination. But Corn, I say, brings a Seed of another Sort, a Grain of Corn is rather a Bulb than a Seed, because it has no Ear-leaves. But on the other Hand, I may observe, that my *Kidney Beans* which were not transplanted, had Beans upon them in *February*.

We may still have a better Judgment, how Hazardous it is to check a Seed when it once begins to vegetate, if we consider, that it contains the whole Plant in Miniature, for such is the *Germe* of the Seed which I speak of, this *Germe* contain-
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ing in it all the Vessels in small, which, by the Help of due Nourishment, are to make up the whole grown Plant; and if the Vessels of a full grown Plant are not larger than fine Hairs, when they are at their largest Degree of Growth, then how extremely minute must their Vessels be, when they are all of them contain'd within the Compass of a Seed, which in Comparison to a full grown Plant, is as a Fly is to an Elephant; and the finer the Parts of any thing, so much more are they subject to alter and change, by every little Accident.

Mr. Tournefort, in his Voyage to the *Levant*, takes Notice of this, when he speaks of the Plant called *Dodartia Orientalis*: The Seeds, says he, are nothing else than a membranous Body, in each of which is rolled spirally, or wrap'd up like a Snail, a young Plant; which is a Twist, or String, of a bright green Colour, half an Inch long, and a quarter of a Line broad, at the Beginning; but growing narrower and sharper towards the End, fastened at the broad End to a spongy and clammy *Placenta*, which is partly in the Seed Vessel, and partly in the Cup. The Creator of all Things, seems to have design'd, by this Plant, to shew us, that the *Embrio's* of Plants are contained in small, in the *Germe* of the Seeds, and that the Seeds are as so many Bladders, which enclose the entire Plant, waiting only a proper nutritive Juice to swell their Parts, and make them become visible.

There are many Things in Nature, which would discover to us the Structure of Things unknown, if we were to consider them attentively: *Malpighius* has a wonderful Talent that Way; and indeed, our Notions, and Systems ought not to be form'd, nor establish'd, but upon a great Number of Observations. For Example, in the Month of *October*, in the Body of a *Tulip* Root, we have ob-

serv'd an entire *Tulip*, on whose Stalk, though not three Lines high, might be seen the Flower, which was not to appear 'till the *April* following: We could plainly discern the six Leaves of the Flower, their *Stamina*, their *Apices*, the *Pistillum*, or young Fruit, the Seed Vessels, and the Seeds they contain'd; and after all this, who can refuse to believe, that all these Parts were shut up, even yet, in a narrower space, and are rendred more or less visible, in Proportion, as the nutritive Juice has swell'd and dilated the smaller Parts. Thus saith Mr. *Tournefort*. I have my self discovered the Blossoms of a *Mezerion*, in the Buds of that Shrub, at *Midsummer*, though the time of their Bloom is not 'till *January*. And likewise in the short Buds of Pears, which appear about *Midsummer*, an indifferent *Microscope* will shew us the Blossoms design'd for the *April* following: And so likewise we may observe the same in the Buds of Vines. I have been the fuller upon this Head, because of the especial Care we are directed to take of Preserving the Seeds of the *Vetches* from Dews; and though, in a particular Manner, we are directed to guard this Seed from the Dew; yet it is certain, that every Sort of Seed will, more or less, receive Damage by the Dews coming upon them. But besides what they might suffer in this Sort, yet it is very rational both to sow our Seed, and cover it as soon as the Ground is broke up, because the Sun will soon exhale the nutritious Moisture which is turn'd up with the Earth; and if the Seed is not sown and cover'd immediately, it will want that nourishing Juice of the Earth to give it Strength.

We are directed not to touch the Ground with any Iron Tool, after the Seed is Sown, which is a Piece of Philosophy somewhat difficult to understand; or is this not some piece of Superstition rather, that prevail'd among the *Roman* Husbandmen;

men; for we find they were no small Bigots in Things of this Kind; however, if it is not of that Sort, perhaps then the Juices of the Plant does not agree with Iron; or else, if the Grounds where this is sown, in *Italy*, were such, as Mr. *Farrington* tells us, are in the Island of *Milo*, which, by means of the Particles of Iron, produce several Kinds of Minerals, as Alum, Sulphur, and the like; I say, if the Ground has Parts of Sulphur in it, the stirring of such Earth with Iron may occasion an extraordinary Heat, being join'd with the Moisture of the Earth, as common Water, Sulphur powder'd, and Filings of Iron will do, and so the Seed, or Plant, may suffer by it; though one would think it should be impossible, that so little Wear as the Iron Tools would suffer, in tracing over the Ground to bury the Seeds, could have any Effect upon the Sulphurous Parts, if there were any; but yet perhaps may Iron part with its Virtue, without being seemingly diminished, as the Load Stone will do to several thousands of Needles, without either growing lighter in Weight, or smaller in Bulk. But then this Participation of the Iron with the Sulphur is such, in our Case of burying the Seeds, or Weeding, that I suppose the Influence is not of long Duration, no more than it would be, when the Ground is turn'd up with an Iron Plow; however it may last long enough to do Mischief to the Grain, or the young growing Plants, for ought we know. The chief Occasion of my offering this as a Reason is, because the Lands about the Neapolitan Side of *Italy*, abound with Sulphur; and it may be, this Secret being known to the *Roman* or *Italian* Husbandmen, was the Occasion of their using Wooden Rakes in some Cases, though not in all, as we find by their Works. The Production of Fire, by the Concurrence of Iron, Sulphur and Water, see in my Notes upon a former Chapter.

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The next Thing which ought to be consider'd, is the Directions given us not to mow, or cut any of our Medick till it begins to shew its Seed; this is certainly an excellent Rule in the Management of a durable Crop of any thing, to let it arrive at the summit of its Perfection, before we dismember it of any of its Parts; that is, that our Plant be fully grown and accomplish'd before we wound it, or cut it; for, according to my System of the Circulation of Sap in Plants, which Mr. Fairchild, and some other accomplish'd Gardiners are now come into pretty well, every Branch which is cut off a growing Plant, is of Damage to the Root, in Proportion to the Bigness of the Branch we cut; for by this Amputation, the concordant Root, with the cut Branch, cannot have such Juices return'd to it as it expects, after the lively Juices it has sent up have done their Duty, and dispensed their Powers to the several Parts of the Branch; for here the Communication is cut off, and so the Root, as I say, which properly belongs to that cut Branch, must suffer, and will even die; and if we were to cut down the Shoots of a whole Plant, before they had compleated their growth for the first time, then all the Roots would perish, and the Plant be entirely destroy'd.

But it is necessary I explain a little further how it happens that this first Cutting should not be till the Plants are in Seed, and that the other Cuttings may be at any time; the Reason for one and the other is, much the same, viz. from a right Knowledge we have of the Growth of a Plant. We are to know, that every Plant whatever, has either a Quantity of Root, or a Number of Roots, proportionable to the Leaves, Stalks or Branches, that appear above Ground; and there is a strict Communication from the Roots to the Branches, by Vessels through which the Sap passes and repasses, doing its proper Offices to the Parts it passes by, and

and being assisted also by those Parts which are imbibed from the Air, helps the Roots, as well as the Sap from the Roots is helpful to the Branches. Now, by the Circulation of these Juices, through the several Parts of a Plant, every Part becomes prone to act like the rest, and compleat themselves more and more, 'till the whole Plant has come to that Perfection which Nature had first design'd it, which is, the bringing of perfect Fruit; then are also the Roots fully qualified to produce perfect Off-sets, or Suckers, which shall have the bearing Quality in them, if, during the Time the Seedling Plant has been growing, it has not been injured by cutting, or lopping; which, as I observ'd before, affects the Root, and keeps it from becoming so strong and vigorous as Nature at first design'd it. By this Circulation of Juices through Plants, all the Parts, both Roots and Branches, are so much partaking of the same Qualities, that Roots may be made to become Branches, and Branches to become Roots, only by shifting their respective Mediums. The Roots have so great a Tendency to the propagating the Species they are of, that we see them frequently employ'd in pushing forth Suckers, or Off-sets, from little Buds which they frame under Ground, while the Branches are at work above. in perfecting their Seeds; The Buds which are fram'd in the Roots, seem to proceed from such Juices of the Plant as appoint the Flower, or Fruit-Buds in the Branches; that is, where such fruitful Juices happen to stop, either in the Root or in the Branch, there must necessarily follow, in such Places, either young Plants, which immediately hatch and spring up from the Root, or Fruit, with Seed from the Branches; which last being bury'd in the Ground, hatch and grow likewise; for the Buds in the Roots act just as the Seeds do when they are put in the Ground. Now our *Medica* being once compleat

pleat in all its Parts, the Roots are then in full Strength, and are capable of acting with Vigour; and we must observe, that in all Plants of this Sort, when the Fruit is full grown, the Circulation becomes slower by Degrees, in the Fruit-bearing Shoots, and is chiefly employ'd in putting forth young Shoots towards the Roots, as is common in the Afters, or Starworts, and such Plants, whose Stalks wither every Year; so then, as soon as we see the Fruit is grown, we may surely know the Plant is full grown, and we can do little or no Hurt to the Circulation by cutting, or lopping, of the Plant; and so, when the young Shoots grow up to a full Size, we may cut them safely, while others are preparing to succeed them, near the Root.

We have a remarkable Instance of the Necessity of letting a Plant remain uncut, 'till it has perfected its several Parts in the Tulip, which renews its Root every Year; for if we happen to break off the Blossom while it is in the green Bud, with the greatest part of the Stalk with it, the new Root, which is then framing it self for the next Year's Service, will not be above half made, and will gather no more Strength from that Time; but if we leave the Flower to perfect it self, and its Seed, then, upon taking up the Plant, we shall find the old Root entirely decay'd, and the new Root as perfect as we can desire. But I have explain'd this fully in my Monthly Writings, and have said enough in this Place, to shew us the Necessity of letting our Claver, or Medick, come to its full Growth, before we begin to cut it.

But our Claver being come to the Perfection we desire, we are directed not to give our Cattle too much of it at first, but dispence it to them in small Quantities, 'till they are used to it. I find, that at the first eating of it, it will purge our Cattle, but being once made a little familiar to them, it will make them grow exceeding fat, unless

unless they have good Exercise. I once was told by a Gentleman of good Credit, that he had two Horses that dy'd with eating Claver: However, when it is discreetly given, it is very serviceable and nourishing to Cattle. It is observable, that the Cowherds about *London*, besides the Grains which they give to their Cows, which they have fresh every other Day, they feed them with the Hay made either of the Medick, or other Clavers, mix'd with Barly Straw, which makes them abound with Milk: More of which Management may be seen in my Monthly Writings of Husbandry, &c.

I may add however, that our Cowherds are not a little jealous of the Clavers, that they will swell the Cattle too much, if it is given by it self; but being serv'd to them with a due Share of Barly Straw, which is drying, the ill Qualities of the Clavers are corrected. I have been told, that the Medicks, or Clavers, being given simply to Cattle, are so nourishing, or rather fatning to them, that it hinders their Breeding.

'Tis well worth our Notice, the Difference made by the *Roman* Husbandmen, between the Sowing for a Crop of Fodder, and the Sowing the same Grain to stand for Seed; they allow seven Bushels of Vetches to a *Roman* Acre, if they are sown for Fodder; and but six Bushels of Grain, if we sow it to stand for Seed. This Difference in the Quantity of Seed shews us, that our Acre of Fodder ought to be sown thicker than the other; the Reason is, because what we sow for Fodder should grow long, or as tall as it can, which the sowing close together will occasion; and the other for bringing of Seed will never bring a full Crop, if there is not sufficient Room for the Plants to grow with freedom, so as to enjoy the Benefit of the Air; this should be consider'd always in Sowing, for what Use we design our Crop, as I have observ'd before,

before, when I mentioned the Flax; for if we were to sow as thick for to bring a Crop of Seed, as we are directed to sow for Fodder, our Plants would be too much stifled to pay us that Way; and if we were to sow for Fodder, and allow no more Seed than we are directed to use for a Seed Crop, then we should neither have our Fodder in so great Quantity as to the Number of Plants; nor would each Plant be much more than half as long as we should desire.

There is one more remarkable Passage, which I cannot help taking Notice of, which relates to the Sowing the Vetch, not before the five and twentieth Day of the Moon; or else, says our Author, it is observ'd, that the Snail does it hurt. It is very certain that this, and most of the other Sorts of Pulse, are subject to be eaten by the Snail, when they are young and tender; and if such a Method as this would free us from the Destruction those Creatures make among our young Crops, it would be very well worth our while to observe it. But let us first consider how far it may be rational, or agreeing with the Laws of Nature. The first Sowing of this is about the Autumnal *Æquinox*, or in *September*; the second in *January*; which, about the last Half of the Month, seems, by the *Roman* Account, to be as forward as our middle of *February*; the Season that the Snail makes its Appearance abroad, is, commonly, from about the middle of *March*, till *November*, in which Month it lays it self up for the Winter, and so remains, till the Temper of Air is such, that some of our more tender Vegetables begins to Spring, it then wakes from its Winter Sleep, and becomes troublesome to the Gardens, when the Weather is wet especially, but in dry Weather they seldom appear; their Food is chiefly upon tender Leaves, before the Juices are digested, or the Vessels of the Leaves have gathered their full Strength; and then all
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the Mischief I perceive they do is, to scrape off the Outside of the Leaves, or of green Nectarines, or such like smooth coated Fruit, with the Teeth in their upper Jaw; but rough coated Fruit they don't care to meddle with; about *Midsummer*, I have seen them shut up with a kind of horney Substance covering the Mouth of their shell; they breed twice a Year, about *March*, and about the End of *September*, or in *October*; that is to say, they lay Eggs as large as Tares, which they deposit about two or three Inches deep in the Ground, even in such Places as has not been disturb'd or broken up for two or three Years before; but how they get their Eggs there, I cannot conceive: In fine, their Manner of Coupling is no less surprising, for each Snail is both Male and Female, and in the Act of Copulation performs both Offices, so that their Increase is prodigious, for they both bring Eggs, and we find their Eggs lodged in the Ground both in the Spring and Autumn Seasons, to the Number of about thirty in a Knot, which fills as much Space as the Snail it self, the Eggs are extremely White and Round. Now the Question is, Whether there is a certain time of the Moon when these Creatures come abroad to seek their Food; and after such a Space, whether they are again laid up till the Moon returns to the same State? If it be so, then how must we contrive to sow our Vetches, that they may be defended against the Snails? I observe, that they seldom appear but in the Evenings, and at Night; and it may be that they come abroad only in the light Nights, and then rest during the Time the Nights are dark; if it be so, then I suppose, this Sowing of the Vetches at the five and twentieth Day of the Moon, is to give them Opportunity of just appearing above Ground, when the Snails are laid up in the dark Nights of the Moon which is to follow; for, I suppose, these Seeds will lie in the Ground

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three Weeks before they come up, and when they are once above Ground, then in a Fortnight more they will become too tough for the Snails; it must, I think, be something of this Sort, that makes the *Roman* Writers press this Matter so much, and even to back their Direction in a Manner as if it was founded upon Experience; and indeed, this carries a good Face of Reason with it, when they sow in *Autum*; for then, if the Snail is laid up in dark Nights, it is likely, that at that Time of the Year they lay themselves up for good and all; and so the young Plants get so much Strength, while the Snails are in their Winter Quarters, that the Spring following they pass without Damage.

The next Thing which we are to observe is their Directions about the Farago of Barly and Oats; that is, the Fodder made from the Grass or Herbage of these Grains; here we are directed to sow ten Bushels of Barly upon a *Roman* Acre, when we design to cut it for Fodder, which is about twice as much as they allow for the same Quantity of Ground, when they sow for a Crop of Grain; we must remember, that the *Ordeum*, or *Hordeum Cantherinum*, which is recommended here to be sown for Winter Fodder, comes up with single Stems, or at most has two or three Stems to a Root, so that the Plants of this Sort take up very little Room, in comparison with the *Ordeum Difficbum*, which will bring twenty or thirty Stalks upon a Root; therefore the *Cantherinum* may be sown much thicker upon all Occasions, than the other. It is plain, the Ancients fed their Cattle upon this, because they tell us, that if we design it to stand for Seed, we must keep our Cattle from it after the first of *March*, which intimates, that the Cattle need not be kept from it till that Time, which is as much as to say, feed your Cattle upon this green Barly till the first of *March*, and then take them off, that the Plants may have Liberty to grow.

grow; this is a Method practised by many of our *English* Husbandmen, with good Advantage, upon the Wheat Grounds; for, besides the Dung of such Cattle, which serves to enrich the Ground, they settle the Earth firm about the Roots of the Corn, and by their cropping of the Corn in its first shoot, occasions it to spread into many Stalks; for this, like those other Plants that will bear topping, will send out many Shoots for one; but if Corn was a Plant that shot out of the Seed with Ear-leaves, or Lobes, this cropping would utterly destroy it. This Method likewise is to be used with Oats that are sown before Winter.

The Ancients, speaking of sowing the *Ervum* upon unplough'd Ground, give us a very good Caution not to turn the Earth too deep, when we plough in the Seed; they mention Ploughs for that Use which do not penetrate the Ground above three or four Inches, which are not only useful in burying Seeds which require to lie shallow in the Ground, but which likewise penetrate no further than the Mould, or upper Stratum of the Ground, which the Farmers call Surface, and, in some Places, Sulk of the Earth.

There is one Remark which they give us concerning the *Ervum*, which is of a very odd Nature; that is, if they sow it in *March*, the Oxen that feed upon it will grow Giddy. Concerning the Virtues of it, *Galen* and *Pliny* tell us, the Grain was eaten by Men, and the Herbage given to the Cattle; the Seeds, say they, were made into Meal, by first steeping them in Water a good while, and then parching them 'till the Rind break; they are then ground and passed through a Boulter, which Meal they keep as of great Use, both to move the Belly downwards, and provoke Urine; yet, say they, being too largely taken, it causeth Headach, Pains in the Belly, and bloody Urine; this is ascrib'd to the Grain only, so that perhaps such of
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this Plant as is raised in *March*, may produce more Seeds than those which are rais'd at other Times, and so have a greater Effect upon the Brain of the Oxen; but the Herb itself, I suppose, partakes of some of the Qualities of the Seed, which, perhaps, may prevail more in the Plants raised in *March*, than in those sown at other Times; for we are very well assured, that the same Spot of Ground, at several Seasons of the Year, is more or less capable of distributing its Juices; in *March*, more plentifully, and much quicker than in *February*, and more in *February* than *January*, and in *December* they are shut up: So it is likely, that the luxuriant Juices of the Earth, in the Month of *March*, may make so great an Impression upon the Seed, that the Virtues of the Plant, which comes from the Seed sown at that Time, may have near twice as much Power as those Plants which were sown in *January*, when the Ground only began to act upon Seeds, and could only disperse its more Vapid Juices.

That the Earth has not always the same Power of dispensing its spirituous and vigorous Juices, is evident, by sowing the same Sort of Seed in every Season of the Year; some Seasons will produce Plants of four times the Strength that other Seasons will do, though we use the same Soil to every one, and even if the Soil be as Simple as we can get it: But I have set forth this at large, in my Notes upon one of the foregoing Chapters. Let us not Mistake, that this Difference in the Virtue of the Plant, is the same as we find in some Plants, which may safely be eaten while they are in the tender Bud, but are strong Poisons when they are full grown; for in our present Case, 'tis always the full grown Plant that is to be used: But, in some Soils, perhaps, a Plant may not have so ill an Effect as in others; if it be true, what is reported of the *Casavi*, which is a Root which was
used

used by the *West Indians* for making of Bread; the Juice of which is so strong a Poison, in the Islands where the Plant generally grows, that if it be tasted by Man or Cattle, they die immediately without Remedy; but the Juice of the same Root, growing upon the Upland, on the Continent, is not at all hurtful. The Account of this Plant, I believe, will neither be disagreeable to my Reader nor foreign to my Subject. The Plant has a very large Root, as big commonly as a Carrot of the largest Size, but brown on the outside, and very white within; of this Root the *Americans* made their Bread, notwithstanding they had Plenty of *Mais* among them, which is the Indian Wheat, both in the Isles as well as the Continent: The Method they used, to make this Root into Bread, was after this Manner; having pared off the Rind, they scraped or broke the Root very small, from whence they press'd out the Juice, which they kept by itself, which then is present Death to any Creature that tastes of it; but if it be boiled to half the Quantity, it makes a good wholesome Drink, somewhat like small Ale; and if set in the Sun, it will become as good as any Vinegar made of Wine; if we boil this Juice 'till it be thick, it will be as sweet as Honey, and serve for the same Use.

The Mass, from whence the Juice was press'd, they put into a Pan, and set it over a Fire 'till it becomes thick and fit for drying; after which it is reduced to Powder, and putting Water to it, make it up in small Cakes, and bake them in the Sun. These Cakes will abide good for a long time, even twenty Years, without Corrupting, affording good Nourishment to the Body, although it is harsh and sharp in the Mouth and Throat: Thus we see the Possibility of rendring the most stubborn Poisons fit for Diet, by separating the Parts;

may, there are some Plants which are poisonous when they are green, and being well dry'd will become wholesome for Use.

In this, and in some of the foregoing Chapters, we are directed to sow more or less Seed of a Sort, as the Richness of the Ground requires. A Gentleman who is now with me, and well skill'd in the Affairs of Husbandry, tells me, this Direction is too general to be understood by those who are not Masters of the Art; and, as he very well observes, 'tis those who I am chiefly to inform: 'Tis therefore I design to be a little particular upon this Head. When we have fix'd upon any particular Seed for sowing, we are to chuse such a Soil for it as best agrees with it; for it may be, that we may not find, in all our Farm, the very Soil which, of all others, would be the most proper for it: But suppose it should be so, that we were lucky enough to find the happy Soil we wish for, then we need not be at the Expence of so much Seed, as if our Soil were but half so proper for it. Now whatever Soil happens to agree the best with a Plant, is, in that respect, a rich Soil, though to a Plant of a contrary Nature, 'tis a poor Soil: However, supposing it to be the First; then from the Delight our Plant will take in growing on it, our Plant will be prosperous, and fill more Room than if it was to grow upon a Soil less natural to it. The Bean, for Example, if it be planted upon a strong Loam, will make a large and vigorous Plant: For as it loves such a Soil as can perpetually afford it plentiful Nourishment, its Vessels fill themselves; and by that Means are more fully explain'd than a Bean which has been set in a light sandy Soil, though both of them were set upon one Day, and expos'd in the same Manner to the Sun, and partook of Showers equally: Nay, and even though the Beans were both of the same Weight, and of the same Bigness too, as near as could

could be; yet would that which grew upon the light sandy Ground, when its whole Plant was perfected, not weigh near so much as the other Plant, that grew upon the Loam; and consequently the Plant upon the Sand would not fill so much Space in the Field as the other. So then we may sow more Beans upon the Sand than upon the Loam, because there will be more Room for the Plants to grow, without smothering one another. When I speak of the Bean, I give it only as an Example, to show that a Plant, when it likes its Soil, will take up more Room than when it does not like it; though at the same time we are to observe, that if a Plant will grow upon a Soil, though it does not ramp abundantly into Branches, yet it will be more Fruitful; and one may sow more seed upon such a Spot, than where the Plant grows more luxuriant.

But if a Farmer be ignorant what particular Soil each Plant of Use likes best, let him make a Trial in the following Manner: Chuse a Spot of Ground in one Place of a strong Clay, another of a Gravelly or Scaley Soil, another in a Loam, another in Sandy Soil, and one, if he can, in a Heathy Soil, which is generally black Sand; upon every one of these let him sow, in the Winter Seed-time, a few of every Sort of Bean, of Pease, of Lentils, of St. Foine, Claver, Tares, Everlasting Pease, Wheat, Rye, Barly, Oats, Turnips, or what other Sort of Pulse, or Grain, he has by him; and at the Seed-time again, in the Spring, let him sow Part of the same Spots, with all the Sorts of Seeds before mentioned, and by no Means pull any of them up 'till the Seed is Ripe, making his Remarks at the same time in Writing, which Soil produces the strongest Plant of any Sort, and which Soil renders each Plant most fruitful. He will likewise have an Opportunity of another Experiment, which is, what Plants are mended by

Winter-sowing, and which prosper best by Spring-sowing. He should likewise try all these Sorts in different Exposures, or Situations, as upon the Sides of Hills, and in Valleys; but upon Soils of the same Kind, which, we suppose, he did before upon the Plain; that he may discover which delight in high Ground, and which thrive best in the Valley. And in the next Place, if he can, let him pick out Parcels of Ground, of the same Sort, which lie wet, and try the same Grains in such Places, and, from the whole, he may set to work with a kind of certainty, which, of Necessity, will bring him better Advantage than his Neighbours; and, considering that two or three Days in a Year will more than serve for the Labour which such an Undertaking will require, will not a Farmer be sufficiently rewarded, if one Trial in ten will instruct him how he may be sure of a Crop, or teach him to gather a Profitable Harvest from Ground, which, before, he esteem'd as Barren, and good for nothing? Thus have I given my Notes upon the several Kinds of Corn, and Pulse, mentioned by *Varro*, *Cato*, *Columella*, and some others. But there are some Kinds of Useful Plants, which yet remain to be explain'd, as well in their Figure as their Culture, which I shall mention in the next Chapter.



C H A P. XIII.

Of Rice, Buck-wheat, Rie-grass, Trefoil, Liquorice, with some others, Useful in a Farm.



THE Subjects which will be treated of in this Chapter, will be such as were, most of them, known to the Ancient Physicians, and Natural Historians; but are not mentioned, or are slightly touch'd upon by the *Roman* Writers of Husbandry: However, as they are useful in the Farm, I think they should not be neglected, no more than such as have been lately discover'd, for the Improvement of Land; for the Design of this Work, is not only to take a Survey of the Ancient Husbandry, but to improve the Practice of that Art in *England*.

The first I shall take Notice of is Rye, call'd in Latin *Secale*; this Corn rises out of the Ground with its *Acrospire* somewhat reddish, which afterwards changes Green, and puts forth several jointed Stalks, which come to be somewhat taller than Wheat, bearing at their Tops smaller Ears than Wheat, set in short Rows, with shorter, sharper, and rougher Awnes; the Grain within being smaller, thinner, and darker than Wheat, and is not enclosed in Husks like Wheat, but easily falls of itself, out of the Ear, when it is Ripe. While it is in Flower the Ear is erect; but being near Ripe the Ears decline, and bend downwards: It has many fibrous Roots; but does not make so bushy a Root as Wheat, nor does it consume the Fertility of the Soil so much as Wheat. Besides this

Kind, which is call'd *Secale Vulgatus*, there are two other Sorts, mentioned by *Tragus*, *Dodoneus*, and *Lugdunensis*; one is the *Secale Æstivum*, or Summer Rye, and the other *Secale Latifolium*, the Rye with broad Leaves: The Summer Rye grows lower, and with fewer Stalks than the common Rye, and has a shorter and lesser Ear, yet arm'd with Awnes as the other, but fewer; the Grain or Corn also is smaller; this Sort is only sown in the Spring.

The *Secale Latifolium* has very broad Leaves, about a Cubit long; 'tis much in other Respects like the common Rye, but brings a larger Grain.

Rye is of a more clammy Substance than Wheat, and is accounted to be next in Goodness to Wheat, if the Corn be sweet and good, and the Bread well fermented and bak'd, it then gives a firm and solid Nourishment to the Body; yet many of our *English* Farmers sow Wheat and Rye together, near of equal Parts, which they call *Maslin*, as well in the Fields as in the Meal; this makes the sweetest and moistest Bread I ever eat. This Corn, I mean the larger Sort, is frequently cultivated in the more *Northern* Parts, bearing the severe Winters better than Wheat. They are sown with us in *October* and *November*, and the smaller Sort is sown in *April* only, and will prosper very well in cool Places, where it has little Sun; nay, I am inform'd by the same Hand that furnish'd me with some of the Seed from the *Apennine* Mountains, that good Crops of it have grown and ripen'd where it has not seen the Sun; as for the Quantity of Seed which an *English* Acre requires, it should be the same that we allow for Wheat; having this always in our View. that the richer the Ground is, so much the less Seed we must bestow upon it; and an Acre of plain Ground will take up much more Seed than

than the same Quantity of Ground measured upon the Side of a Hill. As for the Situation of our Ground, it may be towards the North, and especially for the small Summer Sort of Corn; for we may preserve our better exposed Lands for such Corns as are of a more tender Nature: Both the Winter and Summer Crops will be ripe in the middle of *August*, if they are thus treated, and lie near the Sea; but in some of the inland Countries they will not ripen till about the End of *August*.

The next I shall speak of, is the *Tragopyrum*, or Buckwheat, which some have taken to be the *Ἐρύσιμον*, or *Erysimum* of *Theophrastus*, which is translated *Trionon* by *Gaza*, and is also supposed to be the *Iris* of *Pliny*. To make the Difference between this *Erysimum*, and another Sort of Plant call'd by that Name; some call this *Erysimum Cereale*, *Mattheolus* and *Lugdunensis* call it *Frumentum Sarasenicum*, and *Dodoneus*, *Fegopyrum* and *Tragopyrum*.* *Tragus* makes it *Ocymum Veterum*, and *Clusius* and *Tabermontanus*, *Ocymum Cereale*; but neither *Dodoneus* nor *Lugdunensis* are of that Opinion, but endeavour to prove that the *Ocymum* of *Varro*, *Columella*, and other *Roman* Writers of Husbandry, is no particular Herb, but a general Name for green Fodder, cut to feed Cattle, and to purge them, or else several Sorts of Pulse and Oats mix'd and sown together; but it is plain from *Varro*, that *Ocymum* was sown to fatten and purge Cattle, and that it was to be cut while it was in Flower, from whence it appears, that it could not be a Mixture of Corn and Pulse sown together, because these never Flower together; but it must be some particular Herb, and rather this Herb than any other, which the speedy springing, or germinating of the Seed, which is in three or four Days after Sowing denotes; for the Name *Ocymum*, which comes from *ὠκύς*, signifies *Cito* quickly, and agrees very well with the sudden sprouting of this Herb;

Herb; and besides, we find that the other Qualities of this are answerable to the Character.

This Buckwheat, says *Dodoneus*, is a Grain which is less nourishing than either Wheat, Rye or Barley, but more than Millet or Panick; and the Bread or Cakes made of the Meal of the Seed, is quick of Digestion; yet the Country People in several Parts of *Italy* and *Germany*, feed upon it as a common Bread, and are strong and able to follow hard Labour. This likewise was, and is still in great Use to fatten Cattle and Poultry of all Sorts, which it does exceedingly and quickly. It is a common Observation in *England*, that such Cattle and Fowls as are fatted with this Grain, if they are not kill'd in a short Time after they are fat, they will die of themselves, by being suffocated with their Fat.

This Plant rises out of the Ground with several round, hollow, brittle Stalks, about a Yard high, and of a reddish Colour, bringing the Leaves single upon Footstalks; the Leaves are not unlike the Ivy Leaf in Shape, but are much softer to the Touch; at the Top of the Stalks come forth Clusters of small Flowers, which turn into small triangular blackish Seed, with a white Pulp within; the Root is small and thready. Some are of Opinion that this Grain was first brought from *Africa* into *Italy*; but however, it is very common with us in *England*, and for the Profit it brings, is frequently cultivated by our Farmers in their poorest Grounds, such as sandy Lands upon the Sides of Hills, which the People suppose will bring nothing else; and besides the Profit made of the Grain, the Haulm or Stalks of it being plough'd into the Ground, meliorates the Soil as well as Dung: We find this sown in great Quantities in some Parts of *Surry*; the usual Season of Sowing it is in *April*, and it is ripe in *August*.

The Moistness and Viscosity of the Stalks of this Plant, is somewhat like that in the Lupine, and helps to hold the Parts of Sand together; so that of Necessity it must be a good Manure for all light open Soils, and would undoubtedly be of excellent Use in the first turning up of Heath Ground, whose Parts are always light and open.

The next Plant to be taken Notice of, is the Meadow Trefoile, or what is call'd by our Country People Clover, or Clover Grass; it is call'd in *Greek* Τριφυλλον, and *Trifolium* in *Latin*, because it bears three Leaves together upon one Footstalk; it is probable that *Dioscorides*, altho' he has not made a particular Chapter of this Plant, yet was not unacquainted with it, and has even mention'd it in describing the *Lotus Sylvestris*, which as he says, some call'd *Lybica*; as also the *Medica*, whose Leaves were like the *Lotus Trifolia Pratenfis*, which makes it plain that he knew it, by comparing other Herbs to it: All Authors call these Trefoils by the Name *Pratenfe*, as growing most commonly in Fields. There are several Sorts of Trefoil, but the following which I shall describe is accounted the best, and is the most generally us'd. This Trefoil has many Leaves rising from the Root, set three together upon long Footstalks; among these come likewise Stalks, at whose Extremities are set the Flowers in Clusters, which seldom rise higher than the Leaves: These Flowers are of a reddish purple Colour, and are succeeded by little Cods which contain small Seeds; the Root spreads much in the Ground, and if it likes the Land, will last good three or four Years. We generally sow it in the Spring, having first carefully plough'd and levell'd our Ground, which should be more enclining to Clay than Sand; for this loves a holding Soil, and will prosper exceedingly if we happen to have a Conveniency of watering it in a dry Season: I think the Method
of

of watering these Clover Grounds should be the same as we have directed, for the *Medica*; for this in every respect should be treated like it, and we may then cut three or four Crops a Year. We receiv'd the most profitable Kind of Clover first from *Flanders*, where they have made considerable Improvements with it, as we have likewise done in *England*; but it is our general Way to sow it with some other Seed, as *Barley*, or *Rye* Grass, or sometimes with both *Barley* and *Rye* Grass. When we sow *Barley* with it, we still sow our *Barley* thick enough to bring a good Crop; for tho' there is not so much *Barley* expended in this Sowing as there would be if it was sow'd alone, yet we find that it brings many Stalks, and the Ears are so large, that it produces little less than what we expect from a full sown Crop: The several Sorts of it require several Sorts of Land, and different Situations, whether our Ground be Clay, Loam, Gravel, Chalk, or Sand. There is one Sort of Clover or other that will suit with it, and every one of them when they have grown their due Time will enrich the Ground for Corn when they are ploug'd in; but especially those Soils which are of the stiffest or strongest Sorts, are the most benefited by it. If we sow it alone, we allow from ten to fifteen Pound Weight of Seed for an *English* Acre of Land, according to the Richness of the Ground.

When we speak of Sowing this Seed with *Barley*, 'tis not to be mix'd with the Grain of the *Barley* when 'tis sown, but the *Barley* must be sown first, and then the Clover.

In dry Lands we may sow it early in the Spring with black Oats, that it may have the Benefit of the Rains of the Spring, to make it shoot vigorously; some sow it among Wheat and Rye, where the Ridges are broad, either at *Michaelmas*, which gives it an Opportunity of Seeding and growing thick; or else in the Spring they sow it
among

among their Corn, and cover it only by rowling it.

We are to observe, that we do not cut it till it is knotted for Flowering, which generally happens in *May*, for when we cut it we have good Occasion for hot Weather; for this is a juicy Plant, and requires much more Pains, and more Heat than common Grass to dry it, or make Hay of it as it should be; so that tho' we might cut it three or four Times a Year, yet if we have not a Prospect of drying it well, we had better cut two Crops only in a Summer, and let it stand for Seed, which must be very ripe before we cut it.

We may know the proper Time for cutting this Seed Crop, by observing when the Stalk begins to die, or change to a yellowish Colour; then if you have dry Weather cut it, and let it be as well dry'd as you can, before you carry it Home.

If our Clover begins to decline, we should only mow our Spring Crop in *May*, and then let it stand to feed, which as soon as we see it is ripe and shed, we may feed it down with Cattle, and there will come up a fresh Crop, which will last good as long as the former.

In the feeding Cattle with this, there should be the same Caution us'd that we have mention'd when we treated of the Medick, otherwise they will be in Danger of bursting. When we turn them into it at first, let the Dew be thorowly off, and the Clover be dry, and suffer them not to remain above half an Hour; the second Day we may let them feed as long again, and so by Degrees we may let them feed Day after Day, till they may stay six Hours; and then if the Weather be dry, we may let them feed at Discretion: If we sow Rye Grass with our Clover, it is not so dangerous for Cattle. This Herb is so profitable,

ble, that one Acre will feed as many Cattle as five or six Acres of common Grass.

The next which may properly follow this, is the Rye Grass, of which there are three Sorts according to *Bobinus*, in his *Prodromus*, viz. the *Gramen Secalinum Maximum*, or the largest Rye Grass; the *Gramen Secalinum Majus*, i. e. the larger Rye Grass; and the *Gramen Secalinum Minus*, which is the least Kind; these make Part of the *Gramine Triticea*, or Corn Grasses, which resemble in great Measure the Sorts of Corn they take their Names from: We have some growing like Wheat, some like Barley, some like Oats; but 'tis the Rye Grass which we chiefly recommend. The Stalks of the largest Kinds rise sometimes to two or three Foot high, bearing a few short Leaves: The Spikes of the largest Sort are sometimes three or four Inches long, bearded and not unlike the Ears of Rye; but the Roots contrary to those of Rye, are running Roots and joynted. The smallest Sort of Rye Grass is much like the former, except in its Magnitude, and in the Manner of its Root, which in this is fibrous; the larger Sorts, however, are those which are for our Culture, which besides their natural Tendency to spring sooner than other Grasses, and their Strength to resist the severest Winter, are of good Duration, and will prosper in the most stubborn Clay, altho' it is springy; but it is apt to ramp, and bring hard Stalks, if it be not fed pretty close, and such Feeding will make it grow fine, and afford better Pasture for Cattle. If we sow it alone, then an Acre will take up three Bushels of Seed, and sometimes four Bushels; but when we sow it with Clover, then a little more than a Bushel of Seed will do for an Acre, and about nine Pound of Clover Seed for an Acre; I mean the great Clover, in a Ground where Bricks had been made, and the Ground had been taken away, till the Farmer had nothing left

left but a strong Clay, which lay so low, that the Waters and Springs of the Lands above it were continually breaking in upon the Ground: I remember the Sowing of Rye Grass, and in the sixth Year after it was in great Strength; but there was no Clover with it. I saw it once cut for Hay, but 'twas very coarse, and what I judge the Cattle would not like; however, the Seed of it, when it is thrash'd, might be worth about half a Crown a Bushel, and an *English* Acre of it might possibly bring about six and thirty Bushels of Seed, which at half a Crown *per* Bushel, will be worth four Pounds ten Shillings, besides the Hay, and the Profit of feeding of Cattle afterwards, which may be worth near twice as much more.

If we find our Rye Grass begin to decline, we may sow a Bushel of the Seed upon every Acre, and role it in, and it will renew our Crop. We must take Care that our Hay be throwly dry before we carry it in, for it requires more drying than other Grasses; and the Seed too must be well dry'd after 'tis thrash'd, before we lay it up, or else it will heat and rot.

After this we have the Spurry, which is call'd in *Latin* *Spergula*, by all the Writers except *Thalium*, who gives it the *Greek* Name of *Anthilloides*, and *Fabius Columna*, who calls it *Alpine tenuifolio Altera*, and also *Tricophillos*. *Lobel* calls it *Sagina Spergula*, from its Use in fattening of Cattle: The People of *Flanders* hold this in great Esteem for that Use, and the Feeding of Poultry, for which Reason they sow abundance of it; and also they find, that it greatly encreases the Milk in Cows that are fed with it; and likewise from Experience, causes the Fowls that eat of it to lay more Eggs than usual. Of the *Sagina Spergula*, or Spurry, there are several Sorts; but I shall only describe the greater, which is the Sort for our Care, it is call'd the *Sagina Spergula Major*: This Plant
puts

puts forth several small upright Stalks, about half a Foot in Length, upon which grow small narrow Leaves, at unequal Distances, set together in the Manner of a Star, or the Kewel of a Spur; for which Reason it is called by some Spurwort. The Flowers are many, small and white, standing on the Tops of the Stalks; after which appear small round Heads, containing black Seeds. The Root is small and fibrous, and dies every Year. This Plant delights in dry sandy Ground, and will thrive well in shady Places, and requires no Manure. It is usually sown twice in a Year in *Flanders*, and those Parts, the first Time in *May*, that the Seed may be ripe in *August*; and the other Season is in *September*, after Rye Harvest; these Rye Grounds they plough and sow the Seed without any more Ceremony, which affords them a good Food for their Kine in the Winter, when other Grass is scarce: Mr. *Hartlib* says, that the Milk of those Cows which feed upon this, makes excellent Butter; and the Hens of common Poultry will eat the Herb greedily, which will make them lay abundance of Eggs, as well as the Seed will do. This may serve as a good Thing to begin with, when we first break up Heath Grounds, or other sandy Grounds, which are counted unprofitable; and I judge that every Herb that we discover, which can bring a Crop upon barren Grounds without Manure, or much Culture, may be counted so much clear Profit to the Farmer, as well as so much Riches got to the Nation; and besides, it will lead the Way to more Discoveries.

There are many Sorts of Grasses and Herbs which grow wild, and are unregarded, which if they were known, might turn to great Profit for the enriching of barren Grounds, and feeding of Cattle: It would not be Loss of Time in my Opinion, to follow and observe Cattle when they feed in different Soils and Situations, what particular
Plants

Plants they chiefly delighted to feed upon, that from thence one might make a Choice of those Sorts to cultivate in Quantity for their Welfare. Here we should have an Opportunity of observing too the natural Soil for such Plants, and from thence learn the better how to treat them when we come to cultivate them, and in particular we should remark that these wild Plants prosper without Dung, or other Manure; for a Soil natural to a Plant wants no Help, and if we can find a Soil of the same Kind, we need not dispute the thriving of a Plant; the Use of Dung and other Manures is only to bring a Ground to a certain Order, that it may be like some natural Soil which we design to imitate, which if we succeed in, then it is call'd rich Ground, because it contains all the nourishing Richness which the Plant desires. The Method I propose to discover such Plants, is I think the only Way we can take, and must of Necessity be sure and certain; for there is such a Share of Knowledge imprinted in every Creature, that in the Way of Diet, they know what to take, and what to refuse, and if they have their Liberty to chuse, in a Field where there are perhaps growing an hundred different Kinds of Plants promiscuously, of which the better half should be poisonous, we shall find that they will not touch any but such only as are agreeable to their Health and Welfare; but in this Case I shall give the Precedency to our Kine, who should make the first Choice, and then try our Sheep, whose Nature being different from that of the Kine, will direct them to eat of several of those which the Kine had left; for what perhaps would hurt the Kine, may be wholesome for the Sheep, as we have found in several Instances; however, we shall very likely find some of those Herbs which were eaten by the Cows, will be eaten by the Sheep likewise,

and such Herbs as those are to be chosen before others, because in all our Pasture or feeding Lands, we should contrive to feed them with a Succession of Cattle; that is, after the large Cattle are off, we are to turn in our small Cattle, as Sheep or Goats, if we have any; for these bite short, and will feed very well after Kine: I say, when we have found out such Plants as are agreeable to our large and small Cattle, let us observe the Nature of the Land, and its Situation, and save the Seeds of such Plants, in order to get Quantities of them for sowing a Crop. These Trials may best be made in those Grounds which are reckon'd the most barren, because we have Plants enough already which will prosper in what we call rich Grounds; but it is the poor Grounds which we want useful Plants for.

But after all this it will be objected, that perhaps we may not get Seed enough to sow an Acre in ten Years Time, for perhaps we may not be able to save the Seed of above one Plant to begin with, and it will require endless Patience to wait for a Stock of it; this Thought I know has discourag'd a great many, but I doubt not but the following Account will be sufficient to set aside that Difficulty.

Suppose I have one Ear of a Sort of Barley which I design to cultivate, and make the best of to get a Stock of Seed, this Ear has no more than forty Grains, which I sow at four Inches Distance, so that they will fill the Space of two square Feet and a Quarter, which we suppose is put into the Ground in the Year 1724; if all the Grain come up, we may reasonably expect five or six, nay, eight or ten Shoots from every Root; but to allow for all Hazards, I only shall take four Shoots or Ears to every Plant, at forty Grains on a Shoot, one with another, then will our Increase be the same Year 1724, from the
forty

forty Plants, one hundred and sixty Ears, containing six thousand four hundred Grains of Barley.

The six thousand four hundred Grains after the Rate of one thousand to measure half a Quarter of a great Pint, strike Measure, will then amount to three Quarters of a Pint; and this Number of Grains being sown at the same Distance as before, or twenty in a Foot square, will fill the Space of about three hundred and twenty square Feet, or about a Rod and half of Ground, which we shall sow in the Year 1725.

We are then according to the foregoing Calculation, to expect four Stalks from each Root, with forty Grains on each Stalk, then shall we have six thousand four hundred Roots, twenty five thousand six hundred Stalks, and one Million twenty four thousand Grains increase the second Year, that is, at the Time of Harvest in 1725, and the Year following the Increase will be almost without Number; but however, there must in such Accounts as this be Allowances given and taken: A Gentleman within a few Years, try'd the Experiment from the Produce of one single Root of Corn, and in three Years Time sow'd above an Acre of Ground with the Increase; so that in my Opinion, there is Encouragement enough to propagate the Seed of any new Plant of Use.

I come in the next Place to mention the Potatoe, which is a Root of extraordinary Use to Mankind, both for Food, and the making of Starch; but however it happens I know not, we do not find it cultivated in any great Quantities in *England*, except near *London*: Its Root is very nourishing, and would very well stand in the Place of Bread. We have several Sorts of them, but the best among those that will prosper in our Climate, is the *Virginian* Kind, which brings a very sweet Root. *Clausius* takes the Potatoe to be
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the *Arachidna* of *Theophrastus*, and *Baubinus* in his *Prodromus* places it among the Nightshades, calling it *Solanum Tuberosum Esculentum*, which Tribe it is surely of, as appears both by the Flowers and Fruit. However the more general Name is *Batatas*, or *Potatoe*; the Sort I recommend may be known by the following Characteristics; it springs from the Ground with many hollow flexible Branches, knotted in many Places at certain Distances, which are too weak to support themselves without Props; from these Branches spring the Leaves, which are many in Number, joyned on each Side of a middle Rib by Couples, some larger than others; they are of a dark green Colour, sometimes tending to Redness, resembling in some Degree the Leaves of Water Cresses, but something larger; they are sharp and biting to the Tongue. From the Bosom of these Leaves come forth long slender Footstalks, whereon grow pleasant Flowers, which equal in Bigness those of the wild Mallow, but are in Shape like the Flowers of the *Mala Insana*, or mad Apple; or according to Mr. Ray, are rather like the Blossoms of the Winter Cherry, *Monopetalous*, but cut into five Segments, the Outside of a pale Purple, and the Inside of a bluish purple Colour. From the greenish Pointal which stands in the Middle of the Flower, there darts out a greenish Ray, which stretches out to each of the *Stamina*, the Apices of which are of a saffron Colour, and are five in Number. These Flowers are sometimes ten or twelve in Number, upon the same Stalk, a few of them only being open at one Time; these smell somewhat like the Blossoms of the Lime Tree. When the Flowers have done blowing, they are succeeded by the same Number of little Apples, about the Bigness of a Chesnut, but of an orbicular Form, at first of a dark green Colour, but when ripe of a dark red, almost black; they

they are rarely white and chanal'd, tho' it sometimes happens; they are full of a moist and whitish Pulp, in which lie many small roundish Seeds like those of the Nightshades.

The Root is tuberous, sometimes about the Bigness of a Man's Fist, and sometimes very small; the Root however is commonly uneven, and of an irregular Figure, bearing some Marks or Vestiges upon it, from whence the next Year's Shoots are to spring. It is cover'd with a ducky or dark red Bark; the Flesh of the Root is firm and white, and sometimes the Knob or Swelling from which the Plant springs, when it is taken out of the Earth, is found empty and flaccid.

At the Origin of the Stalk are many whitish fibrous Roots, spread along the Surface, which sometimes penetrate very deep into the Earth, and there frame other Roots of a tuberous Kind; so that the Plant when it is fork'd up out of the Earth towards the Winter, has been found with forty, and sometimes fifty Knobs of different Sizes. We should take up all these Roots before Winter, or they will be subject to rot in the Ground; we must then lay them up in a dry Place for replanting in the Spring.

We are to chuse a light Soil for them, as the best, to make them increase their Roots, tho' I have known 'em grow well in strong Land; but in the lighter sandy Lands, the Roots are much the sweetest, as well as the Increase is greater than in the stiff Lands, one Root bringing forty or fifty Knots, the smallest of these Knots are what we generally save for Planting, after our Land has been first plough'd very deep, and has had a second Plowing in *March*, we then plant them about six Inches asunder, and about five or six Inches deep in the Ground, and they will bring a good Crop that Summer.

Some are careful to lay a large Quantity of Dung upon their Potatoe Grounds, but I have known these Roots to prosper as well without Dung, when the Ground has been well wrought.

The next Improvement of Land which I shall speak of is by planting of Liquoris, of which there are several Sorts, if we reckon the wild Kinds. The Liquoris is call'd by the *Greeks* Γλυκύρις, and from thence *Glycyrrhiza* by the *Latins*, which is as much as to say *Dulcis Radix*, or the Sweet-Root. The Kind which is us'd in the Shops, is that Sort I shall speak of, being of much more Value than any of the others. By some it is distinguish'd by the Name of *Glycyrrhiza Germanica*, and *Levis*, or *Non Echinata*, and *Siliquosa* by *Lobel*; *Tragus* and *Cordus* call it *Dulcis Radix*, and others *Liquoritia*, and *Glycyrriza Vulgaris Siliquata*. This Plant riseth out of the Ground with many round woody Stalks, bearing many wing'd Leaves at uncertain Distances. The Leaves which make these Wings are small and long, set on both Sides of a middle Rib, somewhat resembling of a young seedling Ash. The Flowers appear at the Joynts, after the Plant has stood many Years in a Place without removing; for it must have got into full Root before it will blossom. These Flowers are set upon long Stalks, one above another, making a Spike of Blossoms; they are of a pale blue Colour, and are succeeded by Cods, which are somewhat flat, and of a brownish Colour, in which are contain'd three or four small round hard Seeds.

The Root grows deep in the Ground, as thick as a Man's Thumb, or more, at the Head, sending many long Roots from it, both downwards, and also Suckers from the Sides, whereby it will quickly increase. These Roots are brown without, and yellow within, yielding a very sweet Juice, which is preferable to any that comes from
Abroad:

Abroad: I am told by a Gentleman near *Godfriman*, that one Year he sold an Acre of *Liquoris* for an hundred Pounds; but it is seldom worth less than sixty Pounds *per Acre*.

It delights in a sandy Soil, or any Soil which is of a good Depth, and open in its Parts, and free from Stones. I have known it grow well in black sandy Soil, that has been turn'd up a Year or two before the *Liquoris* was planted in it, and this was done without the Help of any Dung, tho' it is the common Practice among the *Liquoris* Planters, to lay great Quantities of Dung upon these Grounds. The Soil however must lie dry, and be very well dug, and trench'd about three Spits deep, that the Root may have Liberty to shoot downwards, and then I cannot find that there is Occasion to be at the Expence of any Manure, unless we happen to have the cleansing of some Pond, which has lain about a Year to mellow, and that indeed will help the Growth of the *Liquoris*, if it be well mix'd with the Ground when we trench it.

Some are of Opinion that the Ground should be dug twice over, once at *Michaelmas*, and the second Digging in the Spring, just before we plant the Roots. The best planting Time for this Root is in *February*, if the Weather be open, that it may have the Benefit of the Spring Showers, which are of great Service to it at the first Planting; for if our planting Time happens to be follow'd by a dry Season, our Roots will never be so strong as if they were to have the Benefit of Rains; and it is the first Year that gives us the Promise, either of a good, or an indifferent Crop; for upon the Strength of the first Roots, depends the Strength of all that are made afterwards.

In the Choice of our Sets, we should also be careful to collect them from strong Plants, the Crowns or Tops of which are the best; after these, the Runners from the Master-Roots, which have

Knots, or Sprouts on them, are good, and may be cut to the Length of four Inches; but be sure to observe that there be one or more Knots to every Set, for without there are Knots to every Set, the Set will not grow. I think proper to mention this, because for want of such a Caution in my Direction, for planting Horse Raddish, only some of the very smooth Parts of the Horse Raddish Roots were put into the Ground, as thinking they would produce as clear Roots as they were taken from; but none of them came up, and so I was forced to suffer the Blame, till I happen'd by Accident to come there my self, and explain the Matter; for without such Roots as we put into the Ground have Buds, or Knots upon them, they will never shoot.

The Manner of Planting the Sets of the Liquoris, is in Lines, placing the Sets at a Foot Distance, about five Inches deep, and closing the Earth to 'em as soon as possible, for they suffer very much if we let them dry; therefore it is necessary when we prepare our Sets, to lay them in Earth, as soon as we have cut them; not in an Heap, as some do, and cover them over with Earth; but in Layers upon the Earth, or in a Hole dug in the Ground, if it be pretty dry. There make a Layer of Sets, then cover them about two Inches thick with Earth, and upon that another Layer of Sets, and so on till we have got a sufficient Quantity; and then fling some Earth over the Whole. Nor is it less for the Service of the Liquoris, if we carry our Sets any considerable Journey, to use the same Method with them; for our Plants will be the stronger for it the first Year, and it is upon the vigorous Show of that Year, that our Success depends.

At the Time of Planting, if the Season be dry, we must Water our Plantation as soon as the Sets are in the Ground, and continue so to do till they
begin

begin to swell in the Root, if Showers do not fall.

The first Year, to make some Recompence for our Charge of Digging and Planting, we may sow all the Ground with Onions, which will do no harm to our Liquoris, and put Money in our Pockets; for besides the Expence of Houghing and Seed, they will be worth about fifty or sixty Pounds, or perhaps more, if they happen to take with the Ground. But sow nothing among your Liquoris which has a Root which shoots deep in the Ground; for such Plants will injure it.

When our Liquoris has stood three Summers, it will be fit to take up; the Season is in *November*, or *December*, if the Weather be open, for in those Months it weighs most, and is the fullest of Virtue, the Roots having then possess'd themselves of that Share of Nourishment which was to be expended the following Spring in the new Shoots; so that now the Roots are in their Prime for the Buyer, as well as in the best Condition for the Seller, being now full Weight: But if we let them dry, they lose of their Weight, which is a Disadvantage to the Farmer. The best Liquoris are long Roots, free from Knots, and of a good Thickness. The use of this is chiefly among the Apothecaries.

I am in the next Place to speak of the Woad, or Wade, which is a Plant of excellent Use among the Dyers, it is called in Greek *Isatis* and *Isatis* also in Latin, as well as *Glastum*, and by some *Guadum*, from whence the Italian Word *Guado*, which is the Name now in *Italy* for Woad. *Cæsar*, in his Commentaries, mentions the *Glastum* with which the *Britains* used to colour themselves, to make them look the more Terrible to their Enemies, as some People think; but that Custom among them might be used, perhaps, as it is at this Day among several of the *West Indian* Nations, rather by way of Ornament than to strike Terror,
Pliny

Pliny likewise speaks of the *Britains* using of *Glastum*, in the first Chapter of his Twenty second Book. But it remains yet a Difficulty to know from whence the Word *Glastum* is deriv'd, some believing that *Vitrum* should be read in lieu of *Glastum*, because the *German* Word *Glas*, from whence they think *Glastum* is taken, is signified by *Vitrum*: If it should be so, let us consider what some Annotators say, *Glastum forte nomen inditum a Callia inventore qu. Callastum; a Gelu qu. Galastum. Sed quod Vitro colore tingeret a Glas dictum est.* The *Glas* of the old Times had surely a bluish Colour, for the making of white *Glas* is but a Modern Invention; and perhaps the *Isatis* might take its Name of *Glastum* from the blue Colour produced by it. However, that the *Britains* did Paint their Bodies with *Woad* we may be assur'd, from the Accounts we have of those Times. The *Arabians*, as *Avicen*, in his 512th Chapter says, call'd this Plant *Nil*; yet in his 306th Chapter, tells us of another *Nil*, which is a kind of *Convolvulus*, or blue Bell Flower, which *Serapio* calls *Hab alnil granum Nil*; for *Nil* in the *Arabian* Language signifies a blue Colour, such as *Woad*, or *Indigo* produces; or perhaps from *Anil*, from whence was made a blue Colour, formerly call'd, in *England*, *Aneale*, for the Dyers Use, and was brought to us in round Cakes: But this was but a Counterfeit Sort of *Indigo*, as some imagine, or else was a worser Sort of that *Nil*, or *Anil*, that grew in *Turkey*; for the best *Nil*, or *Anil*, came from another Part of the World, as *Salbank* tells us, in his Report of *Indigo*, in *Purchas*, Lib. 3. Chap. 9. Sect. 4. that by Reason of Shipwreck upon the Coast of the *Mogul's* Country, was forced to Travel over Land many Days; and that he found the best *Indigo* was made at *Bianie*, where there are *Indigo* Mills; this *Indigo*, says he, grows upon small Bushes,
that

that brings Seed like Cabage Seed; these Bushes being cut down, are laid in Heaps, for half a Year, to rot, and then being trodden out by Oxen from the Stalks, is ground fine in a Mill, and lastly boil'd in Furnaces, and refin'd and sorted, the best is worth there eight Pence *per* Pound.

Dioscorides, in his fifth Book, Cap. 67. mentions two Sorts of *Indicum*, the one issuing naturally from Canes, or Reeds, and the other a Blue, or Purple Scum that rises on a Dye-fat, which is taken off and dry'd; this might probably be the same Sort we have been speaking of, though related in a different Manner. We have, at this Time, a Colour which is call'd *Flore*y, which is the Scum of the Dye-fat, when we dye Cloth of a Blue Colour, with Indigo or Woad, and makes a fine light Powder.

The *Italians* call our Woad *Guado*, and *Glasto*, which last Name was surely taken from the *Roman* Name *Glastum*; and therefore, I think, we need not Dispute, that when *Cæsar* mentions the *Glastum* in his Commentaries, he meant our *Woad*.

While I am speaking of the Woad, and the Indigo, for the sake of the fine blue Colours they produce, I think it proper enough, to add what I have heard, concerning the Production of a good Blue, from the Plant which we call *Rbue*, which, I am told, being cut when the Shoots are full grown, and the Leaves thoroughly perfected, and laid, with a little Water, into a Trough, 'till it Rots, will yield as good a Colour as Indigo: But, I suppose, it must be separated from the Sap-Vessels, which are the long Threads of the Stalks, and then prepared as Indigo is.

The Woad I have already mentioned is of great Use for dying of Blue, and is of that extraordinary Service to the Dyers, that they cannot well Stain, or Dye their Cloths, of any dark Colour, without it, as a main Foundation. The Plant
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has many long and broad Leaves, somewhat like those of the Plantain, but thicker, and of a dark bluish green Colour; these Leaves are set on all Sides, of a strong upright Stalk, which sometimes rises to three or four Foot high, or sometimes to five Foot; but as this Stalk rises in Height; the Leaves grow smaller, by Degrees, 'till we come to the Top, where the Stalk divides into several Branches, at the Ends of which appear small yellow Flowers, which are succeeded by long flat Hulks, black when they are Ripe, and Pendulous, or hanging downwards, wherein the Seed is enclosed, which, if it be broken, and put in Water, will yield a blue Colour; the Root is white and long, growing downward in the Earth, as the Radish does.

Now, as this is a long rooted Plant, it should of Course be planted in such a Soil as will suffer the Root to run downwards without Hindrance; And it is another Maxim, that all Plants which have long Roots, which naturally run downright in the Ground, Trees excepted, will do best in a light open Soil, which makes this Plant thrive in a Sandy, or Gravelly Soil, if it be tolerably Rich, or in Heart; but in rich Garden Earth some allow it to do best.

When this Plant is long continued in any Ground, it injures the Ground, as some say, because they find the Plant grow weaker in its Shoots; this is very sure, that when any Plant stands a long while in a Place, with a Root of this kind, it will drain the Ground so much of those Juices that are necessary for its Nourishment, that, by Degrees, it cannot be so well fed as at first, and must of Necessity grow Weaker; but, as as I have said before, this Sort of Root draws so different a Nourishment from the Earth than a fibrous rooted Plant, that any Plant, whose Root is Fibrous, may be sown after it, and will prosper as well as if the Ground had lain Fallow; and
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'tis upon the foot of this Reason that the Farmers tell us, that it improves Ground for Corn; for in this Case, the Nourishment which Corn would draw from the Ground, is at rest all the while the Woad is growing upon it. The Manner of this Root's shooting downwards in the Earth, is also the Reason that the Farmers always are careful to plough the Ground deep, and break the Clods as fine as possible, taking away all the Stones they can find, or any other Thing which may interrupt the Progress of the Root; for, as the Root is the Foundation, so if that be not encouraged and preserved in Health, the Plant must of Necessity come to little; but Fibrous rooted Plants are not in so much Danger, because, if one Root happens to be injured, the Plant has many others to assist it.

When the Ground is carefully prepared, we are to sow our Woad about the beginning of *February*; and as soon as it begins to appear, we must be sure to keep it clear of Weeds 'till it be full grown. We are to observe, that this is not to be sown like Grain, or Corn, but after the Ground is ready, make Holes, with short Dibbles, about six Inches assunder, and put five or six Seeds into each Hole. If the Ground happens to be wet, then lay the Ground in high Ridges, for wet Land to these long rooted Plants is always prejudicial.

This Plant is fit to cut when the Leaf is full grown, and is of a bright green Colour, which happens to be sooner in dry than in wet Years; but if we do not cut it as soon as we find it of this Colour, it will presently decline, and change its Perfection to a pale Colour. Some have cut Woad five times a Year, when it has been very prosperous, but three or four times a Year is very common: Nay, we might always cut our Woad four times a Year, but for the sake of one Crop which we save for Seed. It is to be remark'd, that the
Winter

Winter growth of this Plant is not fit for the Dyers use, but is a very good Food for Sheep.

The two first Crops are always the best, and are generally mix'd together; but the third or fourth Crops must always be kept by themselves, for they would quite spoil the others if they were to be mix'd with them. When we find it to be of a right Colour for cutting, we must be sure to lose no Time between the gathering of it, and carrying it to the Mill, for otherwise its fine Colour would be lost.

This Plant does the best when the Spring is a little Moist, for if that Season be dry it is very subject to be injured by the Fly, and other Insects; and sometimes so many of the Plants are destroy'd, that the Farmers are forced to renew it from the spare Plants, which may be taken from some of the Holes, or prick in fresh Seed in the Vacancies: But if they supply the Deficiencies by young Plants, it must be done when the Plants are very small, and by a careful Hand, when the Weather is moist; or if the Season is likely to remain dry, make a little Mud, of fine Earth and Water, in the bottom of a Wheelbarrow, and lay the Roots of the young Plants in it, that they may not dry, taking out a few at a Time, as you use them, and fixing the Earth as hard about the Roots, after Planting, as possible.

Some will sow this two Years together upon the same Ground; but I think it not advisable, no more than for any other Sort of Seed to be sown upon the same Spot two Years successively; the Reason I have given elsewhere; but especially we must not do it if the Plant has been annoy'd by Insects the first Year, for we shall surely have them, in some Degree, the Year following, from the Eggs that were left by them, unless we burn the Ground with the Stumps of the Stalks, which I hold to be a good Way.

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If we are fortunate in this Crop, we may expect about a Tun Weight of Woad from an Acre of Ground; which may be worth, one Year with another, about twenty Pounds; the Seed increases prodigiously, and it is necessary to keep a good Parcel of it by us to make good Deficiencies, where there happens to be any: But before we sow it, it is common to steep it a Day in Water, to make it come up the quicker; but perhaps some of the Preparations which have been mentioned before, for steeping of Seeds, will do better, and serve to keep it from being destroy'd by Insects when it grows up. I think Water, wherein Tobacco has been infused, is the best we can use.

As for the Situation this Plant best delights in, it should be where it may have the full Influence of the Sun, which will ripen the Leaves, and bring them to a better Colour, than what grows where there is little Sun; but then, the Woad that grows the most in the Shade will be larger, and yield more in Weight. The first is best for the Dyers, the other best for the Farmer.

There is one thing in particular which should be taken Notice of, in Relation to this Plant, which is, the Injury it does to Bees, by giving those that Taste of it a Distemper that kills them: This is so certain, that 'tis in vain to cultivate Bees in a Country where this happens to grow plentifully.

A Friend of mine tells me, that upon breaking up a Warren, he sow'd part of it with Woad, and had the greatest Crop that ever was known; as much as brought him five and thirty Pounds from one Acre.

As I have had Occasion to mention the Indigo with this Plant, as it is productive of a blue Colour, I shall add an Account which we have of the Method of making it, by the *Indians*; not with any Prospect I can have of ever making it
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in *England* from the Indigo Plant, for that cannot be render'd hardy enough with us ever to get a large Quantity of it; but that we may, from what I shall set down, be put into a Way of drawing Tinctures from other Plants which are more familiar with us. We receive Indigo from the *East*, as well as from the *West Indies*, which, from the best Accounts I can get, are both made from the same kind of Plant, which is a little Shrub with wing'd Leaves, to be met with in most of our curious Gardens that have Green Houses. The Manner of making it, *De Laet* says, the *East Indians* put the Leaves into a Brass Vessel, pouring hot Water upon them, though some rather chuse cold Water, and then stir them together to draw out the Tincture; this they pour into another Vessel, which has a Hole in its Side pretty high, through which the clear Water may run out, and leave the thick colour'd Substance behind, which they afterwards strain through a Cloth, or Bag, then setting it in the Sun; they make it into Cakes, which is afterwards dry'd and harden'd in Pans, by Fire.

Another Author tells us, that they cut the Branches in *August* and *September*, after the Rains, from which they gather the Leaves, and put them into a long Cistern, pouring Water upon 'em, and press them down with Stones, to keep them under the Water; thus they let them remain for several Days, that the Substance of the Herb may be drawn out of it; then they let out the Water into another Cistern, which is of a round Make; in the Midst of which there is another small Cistern, in which they labour it with great Sticks, like as we do Batter, or white Starch, and letting it settle take off the clear Water, then they stir it again, and letting it settle, take off the clear Water as before, and so repeat this Work 'till nothing remains

mains but a thick Substance, which, being spread upon Cloth, they dry in the Sun, and after 'tis a little harden'd, they make it into small Balls with their Hands, and lay them to dry upon the Sand, for any thing else would drink up the Colour; and also, if it take Rain, while it is laid out to dry, it will lose its Colour and Gloss. The Plant of which this Indigo is made, lasts three Years after it is sown: The Indigo made of it the first Year, while the Plant is tender, is weighty and redish, called *Notee*: That of the second Year is rich, being very Light, and of a perfect Violet Colour; this Sort swims being put in Water, and is call'd *Cyree*: And that of the third Year is blackish and weighty, and the worst of all; this is call'd *Cattel'd*. The best, says my Author, is made within twenty Miles of *Fetipore*, in the *Mogol's* Country, in the *East Indies*.

Next to this I shall place the Herb call'd Would, or Welde, which is used also by Dyers; and particularly, because the name Would has been frequently mistaken for Woad; and this has been confounded the more, because both are used by the Dyers: But as the Woad is used for dying of Blue, the Would is used for dying Yellow; and therefore the Plant is call'd *Herba Lutea*, or *Lutcola*, that is, yellow Herb, but commonly, in *English*, is call'd Dyers Weed. *Pliny* mentions it in his thirty third Book, Chap. 5. calling it *Lutea*; yet *Baubin* refers it to *Genista Tinctorum*, or Green Weed; but that is quite another Thing. *Vitruvius*, in his seventh Book of Architecture, Chap. 14. calls it *Luteum*; and *Virgil* calls it *Lutum*, in the fourth *Eclog.* of his *Bucolics*.

*Ipse sed in pratis, aries jam suave rubenti
Munice, jam croceo mutabit vellera luto.*

It is thought by *Casalpinus* to be the *Myagrum* or *Melampyrum* of *Dioscorides*, and named it after the People of his Time, *Guadarella*; its name *Lutea* was taken as well from the yellow Colour of the Herb and Flowers, when 'tis dry, as from its Use for dying a yellow Colour. With it the Dyers either stain Woollen or Linnen Cloth, or Silk, either Raw or Woven, of a yellow Colour, and also give a green Colour to those Cloths, or Silks, that have first been dy'd with Woad of a blue Colour, which *Vitruvius* was not ignorant of, where he tells us, that a yellow Colour upon Blue is changed into Green; for which Reason there is a great deal of this Herb used in all Countries, and many Fields of it are cultivated, though abundance of it grows Wild in *England*. This Plant, call'd *Luteola vulgaris*, or common *Woad*, grows somewhat Bushey, with many long and narrow flat Leaves, near the Ground, of a dark bluish green Colour, somewhat like those of the Woad, but less, and not so smooth, and the Points somewhat round; this is as the Plant appears the first Year, but the next Spring, from among these Leaves rise several round Stalks, which become two or three Foot high, beset with Leaves, not unlike the former, but much smaller, among which shoot forth some small Branches, which bring small yellow Flowers, in long spiked Heads; these Flowers are follow'd by the Seed, which is small and black, enclosed in Heads that are divided at the Top into four Parts; the Root is long, thick and white, the whole Plant changes to yellow after it has been a little while in Flower. This is found generally by the Way Sides, on the Sides of Banks, and in by-Lanes, as well in moist as in dry Places. In *Kent* they generally sow their Fields with it, just after they have sown their Barly, and the Year following it is fit to gather. The Seed is very small, and should therefore be only

only harrow'd in with a Bush, or rolled in with a Roller; and the finallness of the Seed likewise requires a skilful Hand to sow it even; a Gallon of it is allow'd to sow an Acre. It loves a warm exposure, and will prosper well in any Land without any Manure or other Care than barely sowing of it; nor does it grow so large the first Year as to hinder the Mowing of the Barly or Oats that grow with it; and the second Year it brings a Crop, but must be gathered with great Caution, lest the Seed should be over-ripe and shed; and we must have as great Regard, that neither the Stalk, or Seed, be under-ripe, for then both will be good for nothing.

When it is fit to draw, we must gather it as we do Flax, and bind it in little Handfuls, and set it to dry. When it is fit to house, let the Seed be beat out as soon as possible, unless we can keep it dry 'till *March*. An Acre of this, one Year with another, yields about seven or eight Pounds; and the Seed is generally worth about ten Shillings per Bushel.

I come now to speak of the Madder, which is another Sort of Plant of extraordinary use among the Dyers; the Sort of it, which I shall have Occasion to speak of, is call'd *Rubia major sativa*, or the great cultivated Madder. The Greeks generally call the Madder *Ερυθρόδανον* *Erythrodanum*: But *Nicander* in *Theriacis* calls it *Σχυρίον* *Schyrium*; the Latins, *Rubea*, or *Rubia*; both the Greek and Latin Names meaning the Colour of the Root, and its dying Cloth and Leather of a red Colour. The Sort I speak of, is also call'd in the Shops *Rubia Tinctorum*, and is cultivated in many Parts of *Europe* for the Sake of the Price which the Dyers give for it.

This Kind of Madder shoots forth many long reddish Stalks, trailing on the Ground, which are four square, and very rough and hairy, and full of

Joints, at every one of which appear several long and narrow Leaves standing like a Star, or Rowel of a Spur, round the Stalk, like the Leaves of Clivers. At the Top of the Stalks come forth many small Flowers of a pale yellow Colour, which are followed by small round Heads, green at the first, and reddish afterwards, but black when they are ripe, in which is contained the Seed; the Root is not very thick, but is of a considerable Length, running down a Yard deep into the Ground; it is of a red Colour, and very clear when it is fresh; it flowers about the End of Summer, and the Seed ripens quickly afterward. *Dioscorides* and *Galen* mention this Plant to be useful in many Distempers; but take no Notice of its Use in Dying, which, I am apt to think, was a late Discovery; for, in King *Charles* the First's Time, it was a Patent Commodity, as far as it concern'd the Dyers Use for staining of Red. The Goose-Grass, Ladies Bed-Straw, Woodroof, and Croffwort, are supposed, by some, to be Sorts of Madder: But however, the Sort before us is what alone is used for Dying, and for producing the fine red Colour. Some of the Roots of this Plant will run along the Earth like Ivy, by which this Plant is propagated; for it is not practised to raise it from Seed. The Sets should be provided in *March* and *April*, as soon as they begin to Spring, having a Regard that every Set is well rooted, and has some Runners shooting from it. As soon as we have slip'd them from the main Root, we must lay them in a Basket, with a little Mould, to be replanted as soon as possible.

The Soil proper for this Plant is such as we find free and open, but not directly Sand, unless it be richer than ordinary; it should lie warm, and be of a good Depth. When we prepare it for planting, it should be dug near two Foot deep, and the Clods broken as fine as possible, and then
raked

raked, and the Sets planted a Foot apart. A moist Season is favourable to this Plant, when it is first put into the Ground, otherwise it will require a great deal of Watering before the Sets will begin to shoot; the Weeding then will be our chief Care, which may be done effectually if we cut down the Weeds with an Hough before they flower; for, if we venture them to stand 'till any of the Flowers open themselves, there are some Sorts will ripen their Seeds, though we cut them down; especially such as have Papous Seeds, as Grounfell, and some others. The Madder being thus ordered, we may expect our Crop in Perfection the third Year; but that the Ground may not be unprofitable all that Time, we may sow Onions upon it the first Year, or Spinach, or any other Herb which does not spread too much, or last too long upon the Ground. We must likewise observe to keep our Ground full cropp'd, supplying such Places with fresh Sets, where any happens to go off; but I cannot advise the gathering such Sets from our Plantation, during the first Year of planting, though we shall find enough for our Purpose, for the main Roots will be hazarded by taking them off; but the second Year the Plants will be strong enough to afford us a good Number of Sets, the Roots then being Strong; but this must be done without hurting the principal Roots. However, the best Time of gathering the Sets is after the Madder is taken away, and then we shall be sure of doing no Harm; every Runner then may be cut into Sets, each about three Inches long, having a Bud at the top End, to stand out of the Ground when 'tis planted. But indeed, every one who cultivates this Plant, should have a little Nursery always by him, of Madder, to supply the Place of the defective or dead Plants.

This Root, when it is in a condition to take up, is to be dry'd to a certain Pitch, having first

the Husks taken off by one who is used to it ; for in paring off these Husks, we may lose a great Part of our best Sort, if it be not done by a judicious Hand ; these Husks are the first Sort, and the worst of our Crop, not being worth above twelve or fourteen Shillings *per* Hundred ; but the Price of it happens according as the paring of it has made it richer than ordinary. The next, or second Sort, is the middle Rin'd, and much better than the former, being worth about six or seven Pounds *per* hundred Weight. But the third Sort, is much better than all the rest ; this is the Heart of it, and tends a little to a yellowish Colour ; it sells for about nine Pounds *per* Hundred, and is more or less Advantageous, as the second Sort happens to be taken from it with Judgment. But there are sets of People which go about the Countries on purpose to prepare this Root, who know every particular of its Management, and have a certain Price, which they undertake their Work for, which a Farmer need not grudge them, if they are honest ; for in an Acre of Madder, by their Management only, the Crop may either be rendered forty or fifty Pounds, more or less, in Value. But if it be fairly done, and the Madder be strong, an *English* Acre may very well bring two Hundred and fifty Pounds to the Farmer, and sometimes more, which is a large Profit for an Acre of Ground, in three Years Time ; and much more than the Expences of its Management will be paid in the Crop of Onions, or other Things. which may be sown upon the Ground the first Year of Planting. It delights extremely in a sandy Loam, and wants no Dung ; but if the Ground be too stiff, Manure your Land with Sand, or Heath Soil.

When we consider that this is of so great a Price, and that the Dyers alone, about *London*, are said to use above two Thousand Pounds worth of it every Week, besides what is spent elsewhere, I am

surpriz'd

surpriz'd, that there is not more of it cultivated in *England*, than we have at Present. Some say, that 'tis the Effect of Policy among those who have got the Culture of it at present, who give out, that 'tis an uncertain and expensive Crop; but for all that, are ready enough to run the Hazard of it themselves: And then, as for the Markets being over-stock'd with it, by cultivating a larger Quantity, if the Price should be lessen'd a fifth Part, there will still be Money enough to be got by it.

As another Improvement of Land, I might also add, the Benefit a Farmer might receive from the Culture of Saffron; but this is a three Years Crop too, as well as the Madder, which may be one Reason that keeps our Farmers from embarking in it. As for the Method of its Culture, I have given a large Account of it in my Monthly Writings of Gardening and Husbandry; to which I refer my Reader.

Besides the Plants already mentioned, in this Chapter, for the Improvement of Ground, there are the Teasles, Caraway, Coriander, the Anise and Canary Seeds, which are very profitable to Land. The Teasle indeed grows Wild, in many Parts of *England*, but not in such Quantities as to make any great Profit of; but being cultivated, turns to better Account, the Ground carrying other Crops upon it at the same Time, such as Caraway and Coriander, for Seed, as is practised in several Parts of *England*, and brings in very good Profit.

The Teasle or Fullers Thistle is call'd *Dipsacus*, from the *Greek* Διψακος; it is only cultivated in the Fields, for the Use of the Clothworkers, to raise the Wool upon the Cloth, with the crooked Prickles of the Heads, thus making it fit for the Sheers to cut it smooth, in order to give the Cloth a fine Nap. This Teasle brings only several large and

long Leaves at first, which lie pretty close to the Ground, of a pale green Colour, dented about the Edges, and the Back or Underside of the middle Rib, thick set with short Prickles. From among these Leaves, rise up the Stalks three or four Foot high, arm'd all the Way with short hard Prickles, jointed at several Places, with two Leaves at each Joint, which are so joined together at the Bottom, and encompass the Stalk in such a Manner, that they make as it were a Cup to contain the Rain, or Dews, and are somewhat harder than the bottom Leaves. From between the Leaves and the Stalks, on each Side, there puts forth small prickly Stalks, jointed and bearing the same Kind of cupp'd Leaves, but lesser than the others; at the End of which come forth roundish Heads, arm'd with short crooked Prickles, fashion'd like Hooks, bending downwards; which Heads are green at first, but are white when they are ripe. From these come forth whitish headed Flowers in Circles, flowring by Degrees, beginning commonly in the Middle, and flowring upwards and downwards; after these follow the Seeds, which are lodg'd in the Cells of the Heads, the middle Part of the Head is often hollow, and contains whitish Worms. or Magots. The Root is long, and somewhat great at the Head, and perishes as soon as the Seed is ripe. The Land which this will do best upon, is a tender Loam, well broke, either by double Furrowing or Ploughing, or by the Spade. Some sow it upon such Lands as they do Corn. after they have double furrow'd it, that is, plough'd it with two Ploughs, to follow one another in the same Furrow: Thus is our Ground prepar'd for Sowing about the End of *February*, or Beginning of *March*. If we sow Caraway and Coriander Seed with it, then we must allow about eight Pounds of Caraway Seed, and as much Coriander Seed, to about half a Peck of
Teasle

Teasle Seed, which Quantity will sow an *English* Acre; both the Coriander and Caraway, like the same Soil as the Teasle. The Coriander and the Teasle both bring their Crop the same Year, but the Caraway must not be cut till the second Year, and will last two or three Years afterwards: A Piece of Ground thus sown, must be hough'd twice a Year, *viz.* in the Spring, and in Autumn.

When we cut our Teasles, which are ripe about *August*, they must be ty'd up in Bundles, and be set to dry in the Sun; but if Wet is likely to happen, then we must dry them in the House: An Acre will produce about 150 Bundles, which will sell for about seven Pounds ten Shillings, besides the Profit which will arise from the Coriander Seed, which will be very considerable.

The Annise loves a mellow fresh Soil, well wrought, and may be sown either the Beginning of *September* or in *February*; it is very profitable.

The Caraway is call'd by the *Greeks* Καριον, or *Caros*, and by the *Latins* *Carum*. *Dioscorides* says, it took its Name from *Caria*, the Country from whence it first came. To distinguish between this and other Kinds, this is call'd *Carum vulgare*; it brings several Stalks of fine cut Leaves, like those of the Carot, but not bushing so thick. From among these rise up a square Stalk, about two Foot high, bringing on the Top small open Tufts, or Umbells of white Flowers, which are follow'd by small dark colour'd Seeds, less than those of the Annise, and of a quicker and hotter Taste; the Root is long and small, shaped like that of a Parsnip, but rougher coated.

The Annise is call'd *Ἀνισον* by the *Greeks*, and *Anisum* by the *Latins*. It makes a Plant about two Foot high, the lower Leaves broader than those at Top; they are dented on the Edges, and are set thin upon the Stalks; their Leaves are of a whitish green Colour, and very sweet to the Taste and Smell;
the

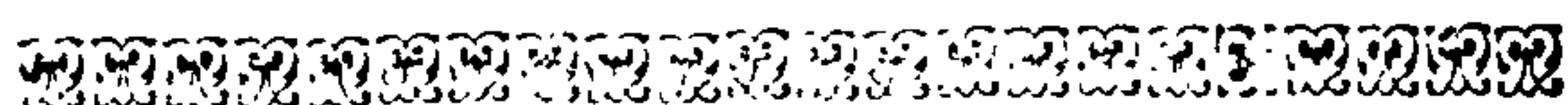
the Stalk is round, and only divided into Branches on the Top, upon which the Umbells appear with white Flowers, which are follow'd with small round Seed of a whitish Colour, very sweet to the Taste; the Root is small, and perishes every Year; from the Sowing to the ripening of the Seed, is a little more than three Months.

The Coriander which I am to speak of, is call'd by the *Greeks* Κόριον, and Κορίανδρον, from whence the *Latins* Corion, and Corionon; but more generally *Coriandrum*, and derived from Κόρις, a little Insect, which is call'd *Cimex* in *Latin*, which has a disagreeable Smell like Coriander when 'tis Green. There are several Sorts of it, but we shall only describe that which is call'd *Coriandrum vulgare*, which at first springing from the Seed, brings Leaves which somewhat resemble Parsley; but as it sends forth its Stalk, the Leaves become finer as they grow near the Top. This Stalk comes to be about three or four Foot high, upon which stand small loose Umbells of white Flowers, changing into round striped hollow Seed, of a pale yellow Colour, when it is ripe; the Root is small, and perishes yearly after Seed Time: The whole Plant, Seed and all, when it is green, and growing, has a strong disagreeable Scent; but when the Seeds are well dry'd, they are very pleasant, and make good Comfits: The Ancients cultivated this Plant in their Gardens, for *Pliny* says it was not found wild in his Time; it flowers in *July*, and the Seed is ripe in *August*.

I shall conclude this Chapter with some Account of the Canary Grass, which the *Greeks* call φαλαεις, and the *Latins* after them *Phalaris*; the Seed is, in some Places, made into Bread, but it has very little Nourishment, and somewhat dry; wherefore, it is sometimes mix'd with Wheat; but is an excellent Food for fatning of Poultry. This has several Kinds; but ours is the most common Sort,

Sort, and is nam'd therefore *Phalaris vulgaris*; 'tis an Annual Plant, to be sown with us in the Spring; it brings jointed Stalks, about half a Yard high, with Leaves like Barley; and at the Top a round chaffy Head, somewhat pointed above, which looks yellow when it is in Flower; this Head, or Ear, contains flat longish shining Seeds, bigger than Millet, and less than Lintseed, of a yellowish Colour, and somewhat like to the Seed of *Sesamum*; the Root is Fibrous.

We have had this among us several Years, brought to us from the Canary Islands, with those Birds which are called Canary Birds. It loves a mellow light Soil, and brings a very beneficial Crop; and may be cultivated without laying any Dung upon the Ground.



C H A P. XIV.

Of Sarrition, or Houghing of Corn and Pulse; its Use, as well in destroying of Weeds, as in nourishing of our Crops; from Columella, &c. with Remarks.



AFTER our Sowing is over, the next Thing to be consider'd is the Houghing of our Crops, concerning which, Authors are of different Opinions; some tell us, that Houghing, and stirring the Earth, must be avoided, because, by such Houghing, the Roots are left naked, and many of them cut and wounded, so that being thus expos'd to the Frost, our Crop is destroy'd: Others tell us, to Weed them in a mild Season is the safest and best way.

Others

Others however allow of such a Work, but do it after a different Manner, chusing the proper Seasons for it, according to the Soil and Situation; for in dry Ground, and in such Places where our Crop lies expos'd to the Sun, we should use this Tillage before Winter; first opening the Ground with the Hough, and then roll it, to settle the Earth close about the Roots; and the same should be repeated as soon as Winter is over: But in wet and cold Grounds, we must only hough our Crops when the Winter is past, without rolling the Ground.

Many, in our Country, hough, or open the Ground in the Winter Season; but 'tis in such Places where the dryness of the Season will admit of it. But it is not proper to do this every where, for every Country is not alike; in *Ægypt*, and in *Africa*, for Example, the Husbandman never touches any of his Crops after he has sown them, 'till they are fit to gather; for such is the State of the Climate, and the Generosity of the Soil, that not any Plant appears but what the Husbandman puts into the Ground, which happens, either because there is little Rain, or because the Quality of the Soil is only favourable to what is sown.

But in such Places, where this houghing is necessary, we must not begin this Work 'till our Crop is all above-ground, and the Face of the Ridges is covered with it; that is, when our several Sorts of Wheat are in their fourth Leaf, our Barley in the fifth Leaf, and our Beans, Pease, and other Pulse, are about three or four Inches above Ground, 'tis then properly the Time to hough them.

The Lupine is a Plant which by no Means will bear houghing; for, as it has but a single Root, if that should happen either to be cut or wounded, the whole Plant will be lost; nor indeed, without this Hazard, would houghing be of any great Benefit
to

to it; for it is so far from being damaged by Weeds that it will destroy them. But as for other Grains, tho' the Earth about them may be stirred while it is moist, yet 'tis better to do it in dry Weather, which will prevent the Mildew. But Barley must not pass this Operation 'till it is very dry.

Some are of Opinion, that Beans need none of this houghing; because, when they are Ripe, they may be drawn by the Hand from the Herbs that grow among them, and those Herbs, afterwards, to serve for Fodder. *Cornelius Celsus* also approves of this Way, where, speaking of the Culture of Pulses, tells us, that after the Beans are gathered, we may cut Hay, or Fodder upon the same Spot. But this, I think, is ill Husbandry, to suffer any Weeds, or Herbs, to grow among our Grain, for our Crop will be very much lessen'd by it; nor is it like a prudent Farmer, to provide better for Cattle than for Mankind, when he has Ground enough for the Use of both. In my Judgment, Beans ought to be hough'd two or three Times; for by that Means, we shall find not only a great Increase in our Crop, in point of Quantity, but also in the Largeness of the Seed, which will fill the Pod so much, that when the Beans come to be shell'd, they will almost make as full a Bushel as the Cods themselves would do, so little will be lost by shelling them.

We may hough them in *January*, if the Weather be open, but taking Care that the Roots are not left too much expos'd, but rather, that we draw the Earth about the Roots, and earth up the Plants, which will occasion them to thrive the better: But this earthing of Plants must not be done at the second houghing, for it rots the young Shoots; so that in this Work there is nothing more to do than to open and spread the Earth equally; this is to be done within twenty Days after the Vernal *Æquinox*, before your Plants
come

come to be jointed; for if we hough, or stir the Earth about our Crops too late in the Season, our Plants will be apt to suffer by the Heat and Drought of the Summer.

When we hough our Crops we also weed them; but this must never be attempted while our Crops are in Blossom, but either before or after Flowring.

Every kind of Wheat and Barley, and every other kind of Grain, which is not double Seeded, comes to an Ear at three or four Joints, and when it is full grown, drops its Blossom in eight Days, after which, the Ear grows fuller, by Degrees, for forty Days, 'till it is full Ripe.

But the double Seeded Plants, such as Beans, Peas, Lentils, &c. hold blossoming for forty Days, and continue growing and enlarging themselves all that Time.

Thus far of the Ancient Culture of Corn and Pulse, between the Seed-Time and the Harvest, which depends chiefly upon houghing, weeding, and earthing of Plants. I shall now proceed to offer some Remarks upon this ancient way of Management.

We find in this Chapter two kinds of Works recommended, which are of great Benefit to Corn, or any other Crop, where they can be used; the one is Houghing, or Sarrition; and the other Rolling of Corn; the first opening the Ground about the Roots of Plants, and the other to settle the Earth about the Roots; however these Works seem to differ from one another, yet are they both useful, as I shall endeavour to explain.

The Hough, in the first Place, we are to observe, was not probably of the Make of those which we now use in *England*, but rather like a Fork, with the Fangs bent downwards, which being struck upon the Earth, the Fangs of this Fork made their Way about three or four Inches into the Ground,

and

and by gently raising of it, the Ground would be broken and open'd. The Reason I have to suppose the *Roman* Hough was of this Figure, is, because I find such a Tool generally used abroad for weeding, and breaking up of Grounds, and could never find such an Instrument, in the several Parts of *Europe*, where I have been, as our *English* Hough: This forked Hough, therefore, I conceive, had its Original from the *Romans*, and has been used ever since by the People of those Nations which were conquer'd by them; and even in *England* I remember to have seen some Instruments of this kind, and am told, that the Houghs which are now so common with us, have not been known above forty Years, which, of the two, are much the best for cutting up of Weeds, but not so good for breaking, or opening the Ground about the Roots of the Plants, as the forked Hough; for the first only pares off the Surface of the Ground, while the forked Hough raises and opens the Ground in such a Manner as to keep it from binding too much about the tender Roots of the Plants, for where that happens, as it often does, our Plants will be check'd in their Growth, but this will help them.

Again, the forked Hough turns the Earth in such a Manner, that the Earth which before was the Surface, is partly turn'd down to the Roots of the Plants, and, in that Sort. may be said to do the Office of fresh Earth. But we find, that the ancient Husbandmen used this Houghing with a View of making their Pulse become more Prolifick, or be more Fruitful; and undoubtedly they were in the right, for upon the stirring the Earth in this Manner about their Roots, they receive some little check for a Day or two, which contributes to make their Juices digest, and come to bearing sooner than they would do if they were to grow uninterrupted; and also will divert the Sap so much from Luxuriance, that it will occasion a
 confi.

considerable fruitfulness in the Plant, which would otherwise have been lost in watery Shoots and Leaves. We are however to take notice of one Passage in this Chapter of *Roman Husbandry*, which is, that by no means we are to hough among any of our Crops, while they are in Flower; but that such Work should be done either before or after the Blossoming of our Crops. I think, it should always be done before, because the chief design of it is to give gentle checks to the growth of the Plants, which, by no means will be proper when the Fruit is growing, unless it could be done in such a Manner, as only to keep the Surface from baking too hard, as it will do in some Grounds, which lie much expos'd to the Sun, and then there wants that due Circulation of Air in the Earth, about the Roots, which is necessary for the Welfare of Plants; for it is equally prejudicial to a Plant, to have the Earth too close and binding about the Roots, as to have it too much loosen'd, or open.

As for the rolling of Grounds, it is likely the Ancients used the same Way of doing it, that we now practise in *England*; that is, with a Roller made of Wood, about fourteen Inches Diameter, and about five Foot in Length: This Roller is used to be drawn over Grounds, to cover some of the smallest, or finest Sorts of Seeds; and also, when Corn, of any Sort, is just come up, it helps to settle the Earth about its Roots, before the Winter Frosts come on, especially where the Land is light; and again, it is of use to roll such Corn early in the Spring, that the Earth which has been rais'd, and made hollow by the Frosts, should be again settled close to the Roots; but this must always be done when the Surface is dry, and when the Dew is off the Ground, otherwise the Mold will stick to the Roller, and the Corn will be torn up by the Roots. In light Ground this is of great Use,

Use, but in moist heavy Ground it is unnecessary if it could be done, because stiff Land is not so much affected by the Frost as to require Rolling; the Surface of such Land is so bound, that the Frosts cannot open and break it, as they do the lighter Soils. But however this is useful to Corn, it would destroy our several Sorts of Pulse, for their Stalks are tender and brittle, but the bare Leaves of the Corn will bend, without receiving any Damage. I have also known the Rolling of Meadows practised in the Spring, with good Success; it settles the Roots of the Grass, and closes the Earth about them, so that they are not soon dry'd by the Sun.

We are to observe, that though this Rolling of Corn settles the Earth close to the Roots, yet does not the Ground become so hard as when it settles of itself, and is harden'd by excessive Heats; the first only closes the Earth, which was lightned by the Frosts; and the latter bakes the Ground, and makes it press too hard about the Roots.



C H A P. XV.

General Rules in Husbandry; with some Account of the Business of the Husbandman, and of the Seeds which ought to be sown upon a Farm, according to the Directions given by Varro, Palladius, Columella, Virgil, and other ancient Writers of Husbandry.



WE gather from *Varro*, *Columella*, and others of the ancient Writers of Husbandry, that such Grain as is sown, *Quarto Sulco*, i.e. at the fourth Ploughing, or upon the fourth Change of Face. such as will happen when we fallow plough our Ground three Times before we plough it for sowing; or, as one may observe, in other Terms, that such Corn as we sow in Winter, in a Farm of twenty five Acres of Ground, will, in preparing the Ground by fallowing, ploughing, sowing, harrowing, weeding, or houghing, and gathering, employ a Farmer one hundred and fifteen Days. And the Management of the Pulse, which necessarily require to be sown, in a Farm of the same Extent, will take up sixty Days Work, which is two Months, according to *Columella's* reckoning; besides which, he computes forty five Rainy Days, or Holidays, when the Men do not Work. And again, when sowing Time is over, they rest thirty Days, which makes, in all, eight Months and ten Days; there then remains three other Months, and twenty five Days of the Year, which are either spent in the Trimestrian sowing, or carrying of Hay, Fodder, Dang, or other Utensils. All which, being added together, make up the three hundred and sixty five Days in the Year.

Varro

Varro computes, that two Yoke of Oxen, as many Ploughmen, and as many Labourers; are sufficient to manage two hundred *Roman Acres* in a Year, provided they attend the Business of the Ground, as above mentioned; but they must have no Obstacle in their Way, and the Ground must be perfectly clear of Bushes. And *Saferna* tells us, that if the Case be so, we must allow more Hands.

Columella tells us, that a Yoke of Oxen is sufficient to plough Ground enough for one Hundred and twenty five Bushels of Grain, and as many of Pulse; so that the whole Autumn sowing, will amount to two Hundred and fifty Bushels; and then he tells us, the Farmer may sow seventy five Bushels of such Seed as should be put in the Ground in the Spring, or at the Trimestrian Seed Time.

These Computations they make after the following Manner, where they tell us, that about four or five Bushels of Wheat will require a Man's Work for Ploughing, four Days; for Harrowing, one Day; for the first Sarrition, or Houghing, two Days; and for the second, one Day; for Weeding, one Day; and for Reaping, one Day and a half.

Five Bushels of *Siligo*, or of fine Wheat, will require a Man's Work as many Days as the former.

Five Bushels of Barley will employ a Man three Days to plough and fallow; one Day to Harrow; one Day and an half to Hough; and to Mow one Day.

About six Bushels of Beans, if the Ground be stiff, will employ a Man two Days to prepare the Ground, and sow them; but if the Ground is light, then one Day is sufficient; and for Harrowing, Houghing, and Gathering, they will require, in all, seven or eight Days Work.

Six or seven Bushels of Vetches, in a stiff Soil, will employ a Man two Days to put them into the Ground; but if the Soil happens to be light, then one Day is sufficient; one Day also to Harrow,

and another to Reap; in all four Days, or three, according as the Ground is lighter, or stiffer.

Five Bushels of the *Ervum*, or *Orobus*, will employ a Man as many Days as we allow for the *Vetches*.

Six or seven Bushels of the *Selique*, requires as many days Work as the *Ervum*, or *Orobus*.

Four Bushels of the *Phaseolus*, or Kidney Beans, will employ a Man the same Number of Days as the *Ervum*.

Four Bushels of *Cicerula* require three days Work, one to put them into the Ground, one to weed them, and one Day to gather them.

A Bushel and half of Lentils require five Days Work to put them into the Ground, to hough them, weed them, and gather them.

Ten Bushels of Lupines are put into the Ground in one Day, harrow'd in one Day, and gather'd in one Day.

Four Sextaries of Millet, and as many of Pannick, will require four days Work to prepare the Ground for them, and to sow them; but it is uncertain how many Days may be required to gather in the Crop; for it is a careful Work.

Three Bushels of Cicers will require ten days Work to prepare the Ground for them, and sowing, and weeding, and gathering them.

Ten Bushels of Flax, will employ a Man eleven Days in preparing the Ground, sowing, harrowing, weeding, and gathering.

Six Sextaries of *Sesamum*, will employ a Man fifteen Days to prepare the Ground, sowing, harrowing, houghing them the first and second Time, and to gather it.

Medica is not to be harrow'd, as is observ'd before, but must be cover'd with Wooden Rakes; an Acre will require four Days Work, in sowing, raking, houghing, and mowing.

Thus far the ancient Writers of Husbandry, concerning the Management of the various Crops of Grain, and Pulse, from the first ploughing, to the gather-

gathering of them. I shall therefore begin my Remarks with Ploughing.

In the ploughing of Layes, which is the first ploughing up of the Grass Ground for Corn, which is a Work commonly done with us in *January*; the best Time for this Work is when the Land is wet, because the Turf then is tough, and will hold to turn without breaking, in the well turning of which consists the chief Part of this Sort of ploughing; which, if it be well done, will lay the Turf so flat and true, that you can hardly see where the Plough went; this depends much upon the Make of the Plough, for the well-doing of which, if the Earth-board do not turn the Turf well, some will nail a small Piece of Wood upon it, to take the upper Part of the Turf as it rises upon the Earth-board, which will cause it to fall over, with the Grass Side downward; but a little Observation will best inform us how to place it.

In the next Place we come to consider the ploughing Fallows, which is a very great Benefit to Land, as appears by the common Practice of it, and in the great Care that Landlords every where take to oblige their Tenants to a strict Observance of it once in three Years; few Lands, as they imagine, being able to bear more than two Crops without it; and I don't know, but that a Year's fallowing will be beneficial to them, let their Land be what it will; nor yet can be persuaded, that the true ploughing of it, tho' it is chargeable, will not pay for their Labour. The Advantage of Fallowing consists in two Things:

First, its laying of the Land in Ridges, and so exposing it to the Frost, Air, Sun and Dews, all which sweeten and mellow the Land very much; the often stirring of it, and breaking the Clots, helps to dispose it for bringing good Crops.

Secondly, it kills the Weeds, by turning up of the Roots to the Air and Sun, destroying not only

those Weeds which grew with the last Corn, but also wild Oats, Darnell, &c. that perhaps were naturally growing upon the Ground, even when they are just sprouting from the Seed, before they can draw out any great Share of Nourishment from the Ground, or Increase by Seeds.

The Way of ordering of Fallows, is, after the Crop is off, to let the Ground lie all Winter, and what Grass, or Weeds, grow upon it, must be eat down with Sheep, in *April*, or beginning of *May*.

When the Farmer has done sowing of Corn, he begins to plough up his Fallows; this first ploughing, in moist Places, ought to be very shallow, well turn'd, and laid close together, because, the thinner the Turf is, the easier it will dry, and kill the Weeds, especially if the Season is hot; at which Time, one ploughing is worth three ploughings in dripping Weather. But in some Places, where there is a very cold Clay, that will not bear Corn well, without being expos'd to the heat of the Sun to warm; here they plough their first ploughing as deep as they design to go. About *June* is the Time of the second ploughing, which the Country People call *Twy-fallow*; at which Ploughing you must go your full Depth. This Ploughing is commonly done early in the Morning, before the Dew is off the Ground, so that there may be Time enough to feed the Cattel before they are employ'd in carrying Hay in the Afternoon. About the latter End of *July*, or the Beginning of *August*, is the third Time of Ploughing, which is call'd *Try-fallow*, or the last Ploughing before they sow Rye or Wheat. Some, however, plough up their Land oftner, following the Rule of the ancient Husbandmen.

If the Ground rise full of Clots, as it will generally do in a binding Soil, we must make it fine by Hacking and Harrowing it after Rain; but then you must not let it remain long before you
plough

plough it up into small Ridges, especially if the Ground be wet; and as near as you can, leave no Weeds or Turfs of Grass unkill'd, or unbroken with your Harrow, because it sours the Land, and causes the Mould to lie hollow from the Roots of the Corn. But if your Land is of such a Kind as will mellow well by the Frosts, 'tis better to let it lie a little rough for the Winter, and sow it with Barley the following Spring. This is also necessary, because the Spring Showers will afford it Moisture enough to make it fine for Sowing; but if the Winter do not dissolve the Clots, which it will not do in every Sort of binding Land, such as the red Loams in *Essex*, which Lands they are often forced to wait for the fallowing off, because they use the Drey Plough, the Point of which is apt to fly or rise out of the Ground in dry Weather, for which Reason they are often forced to plough their Fallows six or seven Times over, and yet the Weeds are seldom destroy'd by it, for ploughing in wet Weather only removes the Weeds from one Place to another, and keeps their Roots cover'd with moist Earth, so that they quickly grow again.

It has been experienced, that the Sort of Plough used in *Hertfordshire*, makes a better Fallow in three Ploughings, than the Ploughs used in *Essex* can do in six or seven.

Sometimes where Land is clotty, and a Shower of Rain happens to fall that soaks thorough them, we may use a Roller to break them.

In *Oxfordshire*, the Rollers are made Octangular, believing that the sharp Edges break the Clods better than a round Roller; and in the Hundreds of *Essex*, where the Soil is a strong blue Clay, they use round Rollers, which are set full of strong oaken Pins, about three Inches long, and about four Inches asunder, in Rows, and the Rows or Lines of Peggs a Foot apart.

However, in *Hertfordshire*, where there is generally a pretty stiff Soil, they always plough if they can in dry Weather, and Harrow in wet, which makes the best Fallows, and always in Fallowing of Land they plough one Ploughing cross the Way that they design to lay the Ridges when they sow them. But in cross Ploughing of Land, it is best only to strike it, and not plough it in Ridges, because when we come to plough it again, to lay it as it should be, it will be difficult to lay it even at the Top of the Ridges, without leaving some Places that will harbour wet.

There are some Lands in *Kent*, which are said to yield good Crops of Corn for twenty Years together, without fallowing; but here they follow *Virgil's* Advice in Changing of Seed,

Sic quoque mutatis requiescunt fatibus arva, &c.

And when these *Kentish* Lands are lain fallow, they are but once plough'd before sowing, and sometimes a Crop of Pease serves instead of it, which is in Effect what we have before related.

In *Sussex* they commonly plough their Fallows but twice, altho' their Land is generally very stiff, and would therefore be much mended by often ploughing; for if the Land does not want fallowing to enrich it, it yet will require ploughing to sweeten it, and destroy the Weeds.

Where Land is but indifferent, and we lie remote from any proper Manure for it, in that Case fallowing is found to be of extraordinary Benefit to it, and is anciently recommended by *Virgil*, as we find in the *Georgics*, Lib. 1.

*At si non fuerit tellus fecunda, sub ipsum
Arcturum tenui sat erit suspendere sulco:
Illic officiant latis ne frugibus le bæ;
Hic, sterilem exiguis ne deferat humor arenam.*

Alternis

*Alternis idem tonsas cessare novales,
Et segnem patiere situ durescere campum.*

Which Mr. Dryden gives us thus in *English* :

*But if the Soil be barren, only scar
The Surface, and but lightly print the Share,
When cold Arcturus rises with the Sun,
Lest wicked Weeds the Corn should over-run
In watry Soil, or lest the barren Sand
Should suck the Moisture from the thirsty Land.
Both these unhappy Soils the Swains forbear,
And keep a Sabbath of alternate Year,
That the spent Earth may gather Heat again,
And better'd by Cessation, bear the Grain.*

Some take a Crop of Wheat, and another of Pease, and then fallow their Land again. In *Staffordshire* they frequently give their Lands Winter Fallowing, or Ploughing, *Quarto Sulco*, reckoning the three former Ploughings of the same Year, and lay their Land in Ridges where they sow Barley ; which is not disagreeable to the Husbandry of the Ancients, according to *Virgil*, Lib. 1.

*Illa seges demum votis respondet avanti
Agricolæ, bis quæ solem, bis frigora sensit ;
Illius immensæ rupeunt horrea messes.*

Thus rendred by Mr. Dryden :

*That Crop rewards the greedy Peasant's Pains,
Which twice the Sun, and twice the Cold sustains,
And bursts the crowded Barns with more than pro-
mis'd Grains.*

Pliny, and others of the Ancients, recommend the ploughing of Land four Times ; but we must observe, to lay no more down in Winter than we can presently raise up again, because if much Rain happens to fall upon our new lay'd Ground, it will be poachy, and be difficult to plough, especially

cially if it be Clay; and therefore it is best to plough such Ground in a Morning, and harrow it down in an Afternoon, what you design to strike the next Day: Or it may be harrow'd in the Morning, before you plough it.

If the Ground be full of Weeds, from the Moisture of the preceeding Summer, the ploughing it early in the Winter will help to kill the Weeds, as well as to mellow the Ground.

Some will sprinkle four or five Pound of Clover-Seed upon an Acre, with the last Crop of Corn, upon such Ground as they design to fallow the next Year, which Clover may serve to feed at *Michaelmas*, and the next Spring, till about *Midsummer*, at which Time we may begin the first ploughing for Fallow, and the *August* following it must be plough'd in small Ridges, and so remain for a Winter Fallow, in order to be sown with Barley in the following Spring.

When we happen to have a good Soil under the Surface of our Ground, which is such as will advantage our upper Soil, to be mixt with it, we may do it by making a deep Furrow with one Plough, and have another Plough to follow it in the same Furrow; or else the Mixtures of Earths may be made by Plough-trenching, which is done by ploughing a deep Furrow, and to have eight or ten Men to follow the Plough with Spades, to fling out the second Stratum of Earth; that is, to dig the Trench a Spit deeper than the Plough had touch'd, and to lay that Earth upon the Ridge which the Plough had made.

In the laying up of Land in Ridges, there are several Methods used in *England*; some in ploughing their Lands lay four Ridges together; others, in the Hundreds of *Essex*, lay six or eight Ridges together; and in some Parts of *Huntingdonshire*, and other Places, where the Ground is chiefly stiff wet Clays, they sow all their Crops upon broad Lands; the middle of the Ridges, in some Places,
rising

rising near a Yard higher than the side Furrows, which greatly helps to drain those poachy Lands; for the chief End of laying Land in Ridges is the draining of it; and the wetter it is, the higher these Ridges may be laid; or the stiffer the Soil is, so much the better will it bear raising. But if the Soil is enclining to be light or sandy, or dry, so should we decline the ridging of it, for the Sun will have so much command over it, that nothing can grow, or even live upon it.

But this Way of laying of Land in high Ridges, can only be done where the Soil is deep. Where the Descent of the Ground does not require the Ridges for the drawing of Land to be laid otherways, they chuse to have them run *East* and *West*, because the Sun then comes between the Ridges.

What Furrows we make, we must be sure to leave them clean and open, so that they may carry off all standing Water, and likewise to observe, that in all the lowest Places, there must be Drains that lead from one into the other.

If the Plough will not make these Drains deep enough, we must then use the Spade, and grudge no Expence to do it as it ought to be; for in the well draining of Corn Lands there is great Advantage.

In the making of Drains, either for Corn Grounds, or Grass Grounds, we ought not to lay the Earth, which we take out of the Drains, near them, but let it be carry'd away some Distance, by Carts or Barrows, by which Means we shall be constantly low'ring our Drain, which otherwise would be fill'd up, or trod in again, and often stop them.

If the Spring should happen to be dry, so that the Ground rises in Lumps, the Air will so harden them, if they be of a stiff Soil, that it will be hard to break them, unless there should happen to fall a great deal of Rain to moisten them;

them: But lest Rain should not happen to fall, harrow such Ground as soon as you have plough'd it, and soon after plough it up again to an Edge; but in light Soils this need not be done.

In some Places, 'tis practised to sow Corn under Furrow, as the Country-men call it; that is, to sow the Corn in the Furrow, and then plough a Ridge upon it to cover it. Others harrow their Ground, and sow Wheat, or Rye, with a broad Cast. Others again, only with a single Cast: And others with a double Cast, and then plough it up on an Edge, in broad Lands, where the Ground is dry.

Others there are who plough their Land an Edge for broad Furrows, and then sow their Wheat, or Rye on it, and harrow it in; which last Way I prefer before the sowing of Wheat, and Rye, under Furrow, in wet or stiff Lands, because the Corn will not be bury'd so deep this Way, as it would be the other; and we may take this Rule along with us, that our Furrows should be deep or shallow, according to the depth of the Soil. As for the Quantity of Ground which we may plough in a Day, one may make shift to plough an Acre in stiff Ground the first Time 'tis fallow'd; but where the Land is already broken up, and not too wet, we may plough an Acre and half in a Day; and in sandy light Soils, it is not uncommon to plough two Acres in a Day.

Farmers tell us, that in stiff Clays they plough and sow one Acre in a Day, and an Acre and half of Barley, or Oats, in the same compass of Time; and in light Lands double as much, with one Team of Horses.

It is necessary to observe the following Rules in ploughing of Grounds for sowing of Crops; that our Winter Crops, such as Wheat, and Rye, should be sown early, before Winter, if the Ground be cold, and later in hot Ground. Again, for our
Summer

Summer Corn, we must plough and sow our poor or light Lands first, and our cold stiff Land last of all; but yet with these we must take care to be soon enough, lest we should want Rain, as I have known sometimes; for then the stiff Ground will grow so hard that it cannot be plough'd, which was the Case in the Year 1723, when, about *London*, the Season was so dry, that many Farmers could not sow any Barly at all.

In some Places of *Hertfordshire*, it is the Custom to sow their Barley with a broad Cast upon wide Ridges; and in *Essex* upon narrow Ridges, as they do Wheat, harrowing it with two small Harrows, which they put on each Side the Ridge, and so draw them right up and down, and then roll it with a Belly Roll, which goes between the Ridges. However, some rather chuse the large square Harrow, and recommend two or three Sorts, one finer than another, to be pass'd over Ground, which would not only render the Ground finer, but cover the Seed the better.

If our Land be very dry, and happens to be on the Side of an Hill, if our design be to lay it down for Grass, we must plough the Furrow cross the Descent of the Hill, a little declining, according to the Quantity of Moisture we shall want to retain, this wou'd help the Land; whereas if we were to lay it in such a Manner, that all the wet could run off directly, then the upper Part would be poor, and the lower Part only would be capable of bringing a Crop.

It is a common Practice in *England*, upon the turning up of Lays, to sow the first Crop with either black or white Oats, according as the Land is either moist or dry. The Summer after this they fallow it, and, according to the Nature of the Soil, either sow it with Rye, Wheat or Barly, and to make the following Crop, either Beans, Pease, Oats, or such like.

If Land is very Strong, or Rank, we should not sow Wheat after our first ploughing, but rather Cole Seed, or Barley, and Wheat after them.

There are some who sow their Land with Wheat after a Fallow, and the next Year fallow it again, and sow it with Barley; and the Year after with Pease, and then fallow it again, and sow it with Wheat, which is a good Method where Land is not in Heart, and Dung and Manure scarce, especially in hasty red Brick Earth, such as we find in *Essex*, which Lands are rendred more fix'd and solid by ploughing.

In *Suffex*, where the Clays are very Stiff, they sow two Crops after a Fallow, and then lay down their Land with Clover, or Rye Grass, for three Years, laying then about twenty Loads of Dung upon an Acre, or else Lime or Chalk it while it is Grass. This is accounted a very great Improvement of stiff Grounds, making them fit for Corn and Grass also; for such Grounds will hardly bear natural Grass upon ploughing up, unless they lie a great many Years, and are well dung'd.

I shall here take a further Opportunity of explaining the several Sorts of Soils mentioned in the former Chapters; as it is chiefly the Stiffness, or Lightness of the Soil, that occasions more or less Work to the Farmer.

The Sorts of Clays which are generally known are the Black, the Blue, the Yellow, and the White, of which the Yellow and the Black are the best for Corn, as the Blue and the White are the contrary; some of these are of so stubborn a Nature, that nothing will subdue them, and are so voracious that nothing will satiate them. Without the greatest Industry, they turn every thing that is laid upon them to their own Substance; and tho' some Clays are more pinguid, and others more open, yet all of them are very tenacious of
Water

Water on their Surface, where it is apt to stagnate and chill the Plant, without penetrating into them; and in dry Seasons becomes hard as Stone, with the Sun and Wind, and incapable of any Use, 'till the industrious Husbandman uses proper Means to open their Parts, and render them more capable of receiving Benefit from the Air, &c.

The chief Produce of these Lands is Wheat, Barley, Grey Pease, Beans, &c. The natural Produce is generally Goosgrafs, wild Tansey, large Daisies, Thistles, Docks, May-weed, Poppies, &c. But some of these Clays will produce good Clover and Rye-grafs, if they are well manur'd, either with Horse Dung, Ashes, Chalk, Lime, or Soot, especially if they are Mossy; but if not, then some Sorts of Marl is recommended, sharp Sand, folding of Sheep, Pidgeons Dung, Malt Dust, &c.

It is certain, that Clays hold Manure the best of any Lands, and yield the strongest Grain, especially if they have a Mixture of Stone Lime. These Lands are commonly sown with Black Oats, at the first breaking up; and then fallow them, as described before, and sow them either with Wheat or Barley, and after that with Oats, or Pease, or Beans.

The best Produce of Chalkey Lands is Barley and Wheat, tho' Oats will do pretty well upon them likewise. Their natural Produce is Poppies, May-weed, &c. The Grass Seeds which will do the best for this Ground, are St. Foin, and Trefoil, and if they be very rich, then Clover. The Manures which are the best for these Lands, are Rags, Dung, folding of Sheep, &c. If Rain happens to fall upon these Grounds before the Corn begins to spring, it will make the Earth bind so hard, that the Corn cannot rise through it, but lie and rot in the Seed.

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In *Oxfordshire*, they commonly manure such Lands with half consumed Dung, which, they tell us, prevents the binding of them too much; and some mix the Dung with sharp drift Sand, which makes it work short, especially if the Ground be any thing dry. It is common there, to sow these Lands with Wheat, or with Wheat and Rye together, which is call'd *Mislen*, or with Barley; but if they sow these Lands with Wheat, then they sow Pease, or Vetches, to follow it, in the sowing of which, it is necessary to take care of fair Weather, lest the Land should bind too hard upon the Seed; but two Nights dry Weather will do well enough.

The Lighter Soils, such as Sand and Gravel, easily admit of Heat and Moisture, and for that Reason are not so Valuable, for they can hold neither one nor the other, they have not tenacity enough to retain Moisture, or Heat; so that such Ground either Burns or Scorches, or else Chills too much, and produces nothing but Moss, or such like Tokens of Distemper. But if it should happen that Sand carries a better Mold than ordinary, and a Bottom of Gravel, or loose Stone, tho' it does not hold the Water, it may produce a forward sweet Grass; and tho' 'tis subject to burn, it quickly recovers itself, with a very little Rain.

When we come to examine the pure Sheer Sand, we find the White, the Black, the Red, the Yellow, and a bluish Sort, and these are either harsher or milder, or softer, and some which is meer Dust, and very light: Besides these, there are the Grey, Black and Ash Colour, which are frequent in Heath Grounds, which are supposed to be the poorest of all the rest, tho' not so in reality, because they will enrich other Lands.

Gravels are also much of the same Kind and Nature, only it is thought, that those which are the
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the most Stoney, or are mix'd with harsh Sand, are the hottest, and the most barren; but if any of them lie upon Springs, they are generally cold.

The profitable Crops, which are cultivated generally upon these Sorts of Land, are either Rye, White Oats, or Turneps. And the natural Plants which grow commonly upon such Lands, are Twitch Grass, Sorrel, Broom, Furze, Brakes, or Fern, Ling, or Heath. Their best Manure is Marle, of the toughest Sort, or any Sort of Clay that will dissolve with the Frost, or Cow Dung, Chalk, Mud. These Sort of Lands are commonly order'd for the Corn they will bear, as Clays; but where they happen to be overrun with Broom, or Furze, the marling of them commonly kills them; only the first sowing is generally with Buck Wheat, or French Wheat, as some call it; for which is made three Fallowings in Winter, and a shallow ploughing in *May* following, about which Time these Lands are commonly Sown, about a Bushel of Seed to an Acre, which generally yields sixty fold; and so with once ploughing up of these Lands, after the Crop is off, they are fit to sow Rye on.

These Lands have seldom more than two Fallowings for Wheat, unless they are full of Weeds. The Wheat which is generally chosen for these Grounds, is the white Lammas Wheat; and after a Fallow there is sown the Rath ripe Barley, and generally fallow them every other Year, reckoning them unfit for Beans and Pease, tho' sometimes they sow them with Winter Vetches; and where it happens that now and then we find a Farmer that will venture upon Pease, he chuses the Rath ripe Pea for his Crop. It is the Opinion of some, that these Lands should be constantly fallow'd.

It is said, that the Farmers in *Herefordshire* make great Improvements of their sandy Lands,
R which

which are much given to Mofs, by burning the Mofs, and mixing of the Athes with Lime, and ploughing them up, after which they sow them with Rye, which brings a great Increase; and after bearing a Crop or two of Corn, may be laid down for Grass to good Advantage.

There are other Lands which are stoney, and these are of different Kinds; some are full of Flints and large Peebles; others have a mixture of Freestone, of Marble, and of Lime Stones; where these Grounds are of a cold Nature, 'tis necessary to pick them out; but if such Soils are light and dry, they are best to be left.

There is a Sort of lean Earth mix'd with a Rubble Stone. The Management of this Sort of Ground is according to its being overgrown with Weeds, or being clear of them; if the Weeds overpower them, they are fallow'd pretty late, but not so late as Sour Lands; but if they are Scary, that is, if they have no Swerd upon them, they fold them with Sheep in the Winter, and add Hay Seed to the Sheeps Dung, to lay them down for Grass; or else old Thatch, or Straw, mix'd with Dung, being lain upon it, is helpful to it; for it is thought by some, that if such Land has no Swerd upon it before it is fallow'd, it will bear no Crop of any Sort.

In *September, November, and December*, these Grounds are fallow'd as the Swerd directs; if the Farmer does it in either of the two last Months, 'tis call'd a Winter fallowing, and that Ground is not stirr'd again 'till it is plough'd up to be sown with Barley; and they answer better this Way than if they were finely till'd. In a favourable Year they will bear Wheat and Messin, and if they are kept in Heart, they will likewise bring good Barley.

These Lands are fallow'd every other Year, except they sow them with Tills, or Lentils. When they

they are quite worn out with this Sort of Tillage, they are laid down with Rye Grass, and Trefoil.

The red hafely Brick Earth, is rather a Loam than a Clay, not having so much of the binding Quality as Clay, suffering the Rains that fall to pass into it immediately; whereas all Clays hold the Water that falls on them, 'till the Sun and Air dries it up, and after Rain, with a Frost, molders to dust. These Loams do well to mix with other Earth, being an excellent Mean between the two Extrems in Clay and Sand, uniting the Parts of those Soils which are too loose, and cooling those Soils which are naturally too hot, and enabling them to hold Moisture.

The best Produce of these Lands in Corn, if they are well dung'd, is Rye; but if they are chalk'd, or marl'd or manur'd with Clay, they bring good Barley, white Oats, Buck Wheat, Turneps, Wheat and Pease. The natural Produce of these Lands is Broom, Fern, Twitch Grass. Of Grass Seeds it will bring good Clover, and Rye Grass, if it be well dung'd; but the Clover will not last long. Chalk, and Sea Coal Ashes is a good Manure for this Sort of Land, as also Marl is a great Improver of it; and likewise a stiff yellow Clay, which moulders with the Frost, has been mix'd with it to Advantage: Some are of Opinion, that burning this Land, and mixing the Ashes with Chalk, would make a good Compost for it. It is observable however, that whatever Improvement you make of this Sort of Land, by Dung, or other Manure, lasts but a little while.

These Lands bind very much after Rain, and change very White, so that no Frost will dissolve the Clods; and if they are new plough'd up, and great Rains should happen to fall upon them, one may walk, or ride on them, as firm, almost, as upon a Gravel.

This Sort of Ground is very subject to Worms, which are great destroyers, both of the Corn and Grass, especially of the Winter Corn; but often ploughing helps to destroy the Worms.

In wet Years these Grounds run much to Grass and Weeds, and the Corn very much into Straw, yielding but thin Ears, and little Grain.

Nothing is a greater Improvement of this Sort of Ground than ploughing, and will graze well the Year after they have been plough'd; the frequent use of the Plough upon them, renders them solid, and greatly contributes to sweeten them; that instead of producing of a rank sour Grass, they now bear a sweet and wholesome Fodder for Cattle: But if we have not a mind to plough these Lands up, and we find the Grass upon them sour, and full of Weeds, mow them one Year, and feed them short with Sheep, which will sweeten and improve them very much.

There are some Lands which are red and sandy, which will not hold any Manure; these are commonly plough'd but once for one Year's Crop, and that Ploughing is just before the Seed is sown; and the Manure, in these Lands, is always brought upon them just before the ploughing, or else a great Part of the Richness of it, would be wash'd below the Surface of the Earth, and below the Roots of the Corn, as it would do likewise upon their Kealy, or Skealy Soil, as they call it, which is Light and Stoney, so that whatever Rain falls upon it, presently sinks through it. Such Ground should never be plough'd in Ridges, but laid flat and even: It is commonly sown with Rye, white Oats, or blue Pease; and altho' such Land is generally shallow, it will bear good St. Foin, or Tills, or Lentills, or Vetches; especially when the Lime Stone, which abounds in this Sort of Ground, is broke into small Pieces.

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There is a Sort of red Land which the Farmers begin to fallow as soon as they can in the Year, before the Sun is too high, for they reckon it does much better if it be fallow'd while it is moist; they seldom stir it a second Time, before they sow it, thinking, that if they make it too fine, it will be over-run with May Weed.

A mixture of Cow Dung, Horse Dung, and the folding of Sheep, is reckon'd the best Manure for this Sort of Ground; they sow it with Wheat, or Maſſen, or Barley and Peaſe, and Fallow it every other Year.

The Way of managing the Heath Grounds in *Kent*, is to cut up the Heath in *May*, and when it is dry to burn it, and spread the Ashes, and then to plough up the Turf with a broad finned Plough, which Turf they burn likewise, and mixing the Ashes with Lime, and Sea Sand, if they can get it, then spread this Compoſt, and lay Dung upon it, and about the End of *September* they sow it with Wheat, and so continue to do for three Years, and the fourth Year sow it with Barley, having first folded it with Sheep; the fifth, sixth, and seventh Year, they sow it with Oats, and the eighth with Peaſe, and after that it will bear a good Crop of Graſs. But in this Case, if Lime, or Sea Sand, are not to be had, any Loam, or Clay, will make a good Manure for it, to be mix'd with the Ashes.

The Way of Managing their Heath Grounds in *Staffordſhire*, is to stock up their Heath in Summer, and burn it, mixing the Ashes with Lime, allowing four Load to an *English* Acre, each Load containing four Quarters, which they Plough under Furrow, about the middle or end of *September*, or begining of *October*. This Land they sow with Rye, allowing two Buſhels of Seed to an Acre,

the increase of which, is commonly twenty five Bushels.

After the Rye, they commonly sow it with Barley, in order to which they give the Ground three Fallows, or Ploughings, the first in *October*, the second about *Candlemas*, and the third in *April*; and this Crop yields much about the same Quantity of Corn, as the Rye.

The next Crop to the Barley, they sow white Pease, for which they Plough but once, in *March*, allowing three Bushels of Pease to sow an Acre; after this, the next Crop is Oats, of the white Sort, if the Land is in Heart; but if it is impaired by the former Crops, then we may sow black Oats but for either of them they allow but one Ploughing, in *March*, and at last lay it down for Crops.

Moorish, or boggy Grounds, which produce Peat, and are of black Soil, which the Country People esteem cold Grounds, are ordered much the same Way as the Heath Grounds, only they burn it deeper; but by that Method it bears little but Oats, of the black Sort, most commonly: However, the Turf of these Lands burnt, and carry'd upon Rye or Barley Lands, is reckon'd a better Improvement than Dung. For my own Part, I am so sensible of the Richness and Value of such a Soil, after it has been expos'd to the Air, and has had Time to mellow, that I prefer it before any Manure, or Compost, that can be made; and where a Farmer happens to possess either Clay Grounds, or such as are Gravelly, or Skaley, where he has a Quantity of this black moorish Ground, may sow what he pleases, with good Success.

Black Mould, which is somewhat fat, yet porous and light, tho' sufficiently tenacious, such as is composed chiefly of the Ruins of Vegetables,
and

and often found in Lands that have been overflow'd by the Sea, or other great Waters, such as now and then are met with in the Fenny Countries; where we find such Lands without a Mixture of Gravel, or Sand, and if they rise in gross Clods, at the first breaking up of the Plough, such Land is excellent, both for Corn and Grass, as we find by Experience, and was highly valued by the ancient Husbandmen.

But, as this Sort of Land is found chiefly in Bottoms, so the Wetness of them often spoils them for Corn; but however, they are still of excellent Use for manuring of other Ground: But where they are dry, they are extraordinary Fruitful, they will bring good Barley, and Wheat; but if they happen to be so rich that you fear the Lodging of the Corn, and are very deep, Liquoris will thrive upon them extremely; or they may be planted with Madder, or may be sown with Hemp, Woad, Cole, or Rape Seed, or other Things, which best agrees with such a Luxuriant Soil; and after these, when some of the Fertility is abated, we may then sow them with Corn. The natural Produce of these Lands is commonly Thistles, Docks, and other rank Weeds.

When Lands are sour, the Way to sweeten them is, to lay a good Quantity of Chalk upon them, while they are in Grass, letting them lie a Year, or more, and then ploughing them up, giving them a good fallowing, especially in a dry Time, in the Summer, which will kill the Twitch Grass, Sorrell, and the Moss, which such Lands are subject to, and will also mellow them better than any other Way. Soot, Dung, Marl, and Ashes, will contribute veev much to sweeten such Lands.

To some sour Lands the Farmers give a Tilt, as the State of the Land is, if it has a great deal of Grass, they fallow it when the Sun

is pretty high, which is called a Scalding Fallow; this kills the Grass Roots, and makes the Earth fine: But if it is light, and has but little Grass upon it, they then plough it early in the Year, and it produces such Grass as will keep it from scalding in the Summer; for if this light Ground happens to scald, they reckon that there is no Way left to recover it. There is no Way so good, for the Improvement of this Sort of Land, as burning, and frequently ploughing of it.

The folding of Sheep is very good for such Land, or indeed, the Use of any of the short hot Dungs, is always serviceable in this Case; Pidgeons Dung, and Malt Dust, is found to succeed very well in such Land, which they plough and sow in with their Corn, to keep the Roots of the Corn warm; but this should not be done in very wet Weather.

So we have a View of several Sorts of Land, and of the Way of Managing of them, as practised in many Parts of *England*; it may not be amiss also to set down the Method used to find out what Share of Sand is in every Sort of Earth. To know this, let us take a Piece of Clay, such as the Brewers use to stop their Vessels with, and dissolve it in Water, then pour off the thick into another Basin, 'till there remains nothing but Sand, which will lie loose in the Water, and when it is dry, will be as loose as the Sand we use for drying of Writings; we shall sometimes find a fourth Part of such Sand, sometimes a third Part, and sometimes half Sand; by which one may partly judge what Sort of Manure will be useful to such Land, and what Proportion of it will be necessary to improve such Ground. I think, about one Half of these large sandy Particles, is a good Proportion to the rounder smooth Parts of any Earth: But if these round smooth Parts are too Predominant, which occasion the binding Quality,

Quality, then the best Method of altering the Quality of such Ground, is by Burning, which is not only a considerable Improvement, but was anciently practis'd, as we find by *Virgil*, in his first *Georgic*.

*Sæpe etiam steriles incendere profuit agros,
Atque levem stipulam crepitantibus urere flammis.
Sive inde occultas vires & pabula terræ
Pinguia concipiunt: sive illis omne per ignem
Excoquitur vitium, atque exudat inutilis humor:
Seu plures calor ille vias, & cæca relaxat
Spiramenta, novas veniat qua succus in herbas:
Seu durat magis, & venas astringit hiantes:
Ne tennes pluvie, rapideve potentia Solis
Acrior, aut Boreæ penetrabile frigus adurat.*

Which *Mr. Dryden* Englishes:

*Long Practice has a sure Improvement found,
With kindled Fires to burn the barren Ground:
When the light Stubble to the Flames resign'd,
Is driv'n along, and crackles in the Wind.
Whether, from hence, the hollow Womb of Earth,
Is warm, with secret Strength, for better Birth:
Or, when the latent Vice is cur'd by Fire,
Redundant Humours, thro' the Pores expire.
Or, that the Warmth distends the Chinks, and makes
New Breathings, whence new Nourishment she takes:
Or, that the Heat the gaping Ground constrains,
New knits the Surface, and new strings the Veins;
Lest soaking Show'rs should pierce her secret Seat,
Or freezing Boreas chill her genial Heat,
Or scorching Suns too violently beat.* }

This Way of meliorating of Land, by burning, is very rational, as *Bersman* observes; for the Diseases of Grounds proceed chiefly from four Causes, viz. Leanness, coming from defect of Aliment,

ment; Sliminess, caused by excess of Moisture; Closeness, which binds up and choaks the Seed; and Laxity, which gives too easy admission to Heat and Cold; the Poet has described in one, as many Remedies; for burning cures the Leanness, consumes the Sliminess, opens the Closeness, and shuts up the Laxity of the Earth.

We are told by others, that the Heat of the Fire warming the Land, wastes the acid and sterile Juices, which hinder the Fertility of it, and leaves a Salt upon the Ground, in which the Fruitfulness consists: This piece of *Roman Husbandry*, as it was first began in *England* about *Devonshire*, so is call'd *Devonshering* of Ground. But Experience tells us, that it is not good for Stoney Lands, or Chalky Clays; nor should it be too often repeated upon any Soil, especially where the Mould is shallow; neither should Corn be sown too long upon such Grounds: This, is excellent for sour Lands, or such as have lain long untill'd, and are overrun with Weeds; for here the very Seeds are destroy'd, so as never to appear again, unless one could believe, with some *Rosicrucian* Philosophers, that the Ashes of Plants will produce Plants of the same Kinds. It is likewise good for Land, which runs its Crops too much to Straw, and yields but a lank short Ear; whether such Lands are wet or dry, cold or hot, this burning is of great Improvement, causing some poor Lands, in two or three Years Time, to bring as much Profit as the Inheritance is worth.

The common Method of ploughing these Grounds for burning, is with the brest Plough, which a Man shoves before him, with which they pare the Turf, about half an Inch thick, unless the Land happens to be full of Strings, or Roots, and then the thicker it is pared the better; the Turf they turn over as they cut it, that it may dry; but if the Season be dry, and the Weather hot, then the
Turf

Turf will need no turning ; but if on the contrary, the Weather be very wet, then if the Turfs are raised, and set a little hollow, they will the sooner be fit for burning.

When our Turf is dry, about two Wheelbarrows full should be laid to an Heap ; but the smaller these Heaps are, the better, so that they contain Matter enough to make such a Fire as will thoroughly consume the Heaps to Ashes.

If the Turf be full of Roots, or have a good Head on it, or if the Soil be deep, that it may be cut of a good Substance, it will burn without the Addition of any other Fuel ; but if not, the Heaps should be raised on a small Bundle of Furze, or Brakes, and if it be in a Coal Country, one may add of the waste Coal to every Heap, and then set it on Fire.

These Hills, after they have done burning, should remain untouch'd, 'till they have been soak'd with Rain, and then spread upon the Ground, which should be done in a calm Time, that the Wind may not carry away the Ashes, nor prevent the equal spreading of them ; at the spreading of these Heaps of Ashes, it is commonly practised, to pare away some of the Surface under every Heap, and spread it with the rest, that those Places may abate in the extraordinary Abundance of the Fertility they have gain'd by the Fire.

When we plough this Ground for sowing, it must not be more than half plough'd, that is, hardly two Inches below the Depth of the Ashes, and there likewise should not be much more than half the Quantity of Corn sown in such Land, as we sow upon other Lands ; and it is reckon'd the best to sow our Corn upon such Grounds pretty late. If we sow them with Wheat, the latter End of *October* is the best, because if we should sow it sooner, it will grow too rank.

They

They commonly cut the Turf for these Lands about *May*, or any Time at the Beginning of Summer; but the sooner the better, because of having Time to bring the Land into proper Order: The Expence of cutting the Turf, and carrying it on Heaps, and burning it, is commonly done for four and twenty Shillings *per Acre*, where Men Work for fourteen Pence *per diem*.

We must have a special regard not to burn our Turf too much; we must only burn it enough to make it break, and spread well, for the overburning it, to white Ashes, makes it lose the Nitrous Salt; and tho' the middle Part of the Hills, will be more burnt than the Outside, yet, by keeping of the Fire from breaking out, and by laying of any combustible Matter on the Outside, the Salts may be fix'd in all Parts of it, for which a slow Fire is best.

In some Places 'tis practis'd, to stub up Furze, Broom, Heath, and such like, and lay them on Heaps, and when they are dry, to cover them with the Parings of the Earth, and burn them: Others burn their Stubble upon their Land; and some again gather either Stubble, or Fern, or other Trash, together in Heaps, and burn them; adding to every Heap of Ashes, about a Peck of unslack'd Lime, covering it with the Ashes, and letting it remain 'till the Rains fall, and then spread the Lime and Ashes together upon the Land.

'Tis observable, that this Sort of Improvement tends chiefly to the Encrease of the Product; whereas other Manure, such as Dung, &c. encreases rather the Substance of the Straw, and breeds Weeds, rather than occasions Fruitfulness; tho' some are so fond of Dung, that they still are of Opinion, that some of it should be laid upon these Lands, at the ploughing them up for a second, or third Crop of Corn; which rather ought to be at
the

the Time of laying them down for Grass, for then it may perhaps be helpful to them,

As for the Improvement which is made by Chalk, we must consider, that it is not every Sort of Chalk which will benefit Land, to use it as it comes out of the Pit; there is one Sort which is hard and dry, which is not beneficial to Land, 'till we have made Lime of it; and the other Sort, which may be used without Burning, is soft and unctuous, which easily breaks by the Frosts: This is a great Improver of most Lands, and will greatly alter the Nature of them, especially such as have not known the Use of Chalk before; it is apt to make Land so vigorous, in giving forth her Nourishment, that unless we dung it, it expends its Strength too soon; this we should always remember, or else the Earth will receive little Benefit by a second chalking, without resting a great many Years to recover itself, unless it be some very particular Ground; which is the Occasion of that saying, that Chalk makes a rich Tenant, and a poor Landlord; for which Reason, some allow only one Load of Chalk, to two or three Load of Dung, or Mud, or fresh Earth, which are as good as Dung, and will render the Land strong and hearty, so as to yield a constant Advantage.

Chalk does the best for sour cold Lands, and commonly is of the greatest Advantage to such Grounds as lie the farthest from it, because those Soils near it, partake too much of the Chalky Quality.

In some particular Sorts of Lands, the Use of Chalk only has render'd them fertile in Corn, for fourteen Years together; the Allowance to an Acre was about fourteen Loads.

It is good to carry Chalk upon a Lay, a Year or two before we plough it up; for by that Means it will sweeten the Surface of the Earth, and will

not work so much downwards as it would do if the Land was plough'd up at first. When such Ground is laid down for Grass, tho' one cannot boast, that the Bulk of the Grass will be much encreas'd, by means of the Chalk; yet we have this Benefit from it, that the Grass will be much sweeter, and fatten the Cattle much sooner, than Lands that bear ranker Grass, and enrich the Milk of those Cows that feed upon it; so that it shall yield more Cream in Proportion, than the Milk of other Cattle which feed upon more Luxuriant Grass; this is sufficiently evidenced in the Milk of those Cows which are fed upon such Lands as afford a Chalk of this Kind.

They have a Method in *Kent*, of saving abundance of Trouble in the digging of Chalk; where they find it upon the Sides of Hills, they undermine the Bottom of the Chalk, as far as they would have it fall, and upon the Top they cut a Trench, as far as they have undermined the Bottom; this they fill with Water, which, in about twelve Hours Time, will soak through, and cause a Flake, from the Top to the Bottom, to fall the whole Breadth of the Place they undermined. But as Chalk, in many Places, lies a great depth in the Earth, it is dug in such Places, after the Manner that Miners carry on their Shafts of their Mines, and draw it up in Baskets: In such Places it is commonly sold for a Groat, or Six-pence, the Cart Load, which Price is according to the Depth it lies in the Ground, and the Rate Workmen have, where it happens to be; but, I suppose, the Workmen have fourteen Pence *per Diem*, in this Case.

But if it happen, that our Chalk should be of a hard Sort, such as was not fit to lay raw upon the Ground, yet it is not unfit for Lime; and also, any Sort of Stone, which is not of a cold Nature, or Sandy. Marble is much the best of
any

any Stone, and that is not wanting in most Places, where there are high Hills that have not Chalk; besides which, Alabaster, Slate, and all Sort of Sea Shells, make an extraordinary Lime, when they are burnt, or calcined; but they are hard to burn, unless it be in a Reverberatory Kiln, because they are apt to run to Glafs: It is a Rule, that the harder any of these Bodies are, so much the better Lime they make, only they require a stronger Fire to burn them; yet we may either burn them with Wood, Coal, Fern, or Turf, any of which will make a Fire hot enough.

The Kilns used for the burning either the Stone, or the Chalk, are commonly made in a Pit, either round or square, and as large as is required for the Quantity which is to be burnt; this Kiln is made wide at the Top, and narrow'd by Degrees, 'till they come near to the Bottom; the Inside of this Pit must be lin'd with a Wall made of Lime Stone; at the Outside, near the Bottom, they leave a Hole, or Door, by which they may take up the Ashes, and above that, some have an Iron Grate, but others rather chuse to Arch it over with Stone, or large Pieces of Chalk; and upon this they lay a Layer of Stone, or of what else they burn in the Kiln, and upon that a Layer of Wood, or Coal; which if they repeat, *stratum super stratum*, 'till the Kiln is full; only observing, to make the uppermost Layer always of Wood, or Coal, or what else they use for burning of their Lime, and not of what they make their Lime of; to this they set Fire at the Hole underneath, and so let it Burn 'till it is fit for Use.

Chalk is commonly burnt in twenty four Hours; but Stone often takes up sixty Hours.

Ten Bushels of Sea Coal, or one Hundred of Faggots, about three Foot long, will burn forty Bushels of Chalk; and forty Bushels of Chalk, will yield thirty Bushels of unslack'd Lime.

It

It has been practised, where Chalk is scarce, to take Chalk Rubbish, and mix it with Water, working it together as they do Clay for Bricks, and then being put into Brick Moulds, and fashioned into Shape, and dry'd, will, after they are burnt, make as good Lime as any Chalk; but the Stone Lime is much the best for Land, as well as for all other Uses, which, in many Places, they carry upon Land to the Proportion of a Bushel to a Pole square, or a square Rod of Ground, which makes an hundred and sixty Bushels to an Acre; every Heap should be covered with Earth, as soon as 'tis carry'd upon the Ground; and so remain 'till the Rains fall and slack the Lime, and then spread it.

Some are of Opinion, that 'tis best to carry it out to lay on the Ground hot from the Kiln; and that it does best upon a light sandy Land, or upon a mix'd Gravel; but that it is of no Benefit upon wet or cold Clays, or Gravells.

Dung, or the Cleanings of Fish Ponds, or other Mud, or fresh Earth, is good to mix with it, and makes a rich and profitable Manure, and wonderfully improves a sandy or gravelly Soil.

Some have mix'd Stone, Lime, and Cow Dung together, which has rendered sandy Ground capable of producing an extraordinary Crop of Barley, and other Corn.

'Tis the Quality of Lime to work downwards, like Chalk; and therefore 'tis best to put it upon the Lay the Year before we design to plough the Ground.

Sir *Hugh Plat* advised, that when we lay Lime upon the Grounds, lying upon the Side of Hills, we should lay it upon the upper Side of the Land, so that the Richness of it may wash down to the lower Parts, which indeed will do well when we lay Dung upon such Lands; but Dung and
Lime

Lime together is much better upon any Land, than Lime alone; as well as Chalk and Dung together, is better than Chalk alone.

Next to these is the Earth call'd Marle, which is of several Sorts; one of them, is the Cow Shut Marle, which is of a brownish Colour, and has little Lumps of Chalk, or Lime Stone in it; this is found under stiff Clays, and is very hard to dig.

The second Sort is Stone, or Flag Marle, which is a Sort of soft Stone, or rather Slate, of a bluish Colour, which easily dissolves, with Rain or Frost; this is found on the Sides of Hills, and near Rivers, and is a Sort of Marle which lasts a great while.

The third Sort is the Peat Marle, or Delving Marle, which is close, strong, and very fat; 'tis of a brownish Colour, and is found on the Sides of Hills, and in wet or boggy Grounds, which have a light Sand in them, about two Foot deep; this Sort is reckon'd to be one of the strongest Marles, and is esteem'd the best for sandy Grounds; only we must use it in a double Quantity.

Another Sort is what is call'd Clay Marle, which is somewhat resembling Clay, but is fatter, and sometimes mix'd with Chalk Stones.

One Kind is call'd Steel Marle, and is commonly found at the Bottom of Pits; this is apt to break into Pieces of a Cubical Figure.

A sixth Sort is call'd Paper Marle, which lies near Coals, and appears like Leaves of brown Paper, only is somewhat whiter in Colour.

Markham tells us, that there are four Sorts of Marle in *Essex*, viz. a grey, a blue, a yellow, and a red Sort; but the blue is reputed the best, the yellow next to that, and then the grey; but the red lasts but for a short while; the Goodness of either of these is not so well known by the Colour,

lour, as that they are Simple, and are pure from Mixture.

Good Marle should have the following Qualities; that it break in Pieces of a Cubical Figure, or into thin Flakes, and that it be without any Composition, either of Gravel or Sand; that it should shatter and fall to Pieces, and Flake like Slate Stones; after Wet or Frost, or by being expos'd to the Sun, it should turn to dust; or at least, when it is dry, should not hang together like Clay, but may open the Parts of the Ground we lay it upon. With these Properties we may be satisfied the Marle is good, and consequently may expect good Benefit from it.

The Farmers in *Staffordshire* esteem the Dice, or Slate Marle, to be better than the Clay Marle, and reckon the grey Marle to be the best for Pasture Grounds, and the blue Marle to do the best for Corn Lands.

In the *North of England*, the Marle, for the most Part, is much upon the Loam; but that which is the most common in *Sussex*, is more like Fuller's Earth, and therefore must of Consequence be the fattest. It is likely, that Marle is much of the same Nature as Chalk; for when the Potters meet with any Chalk, or Marle, mix'd with their Clay, tho' they will hold burning with the Clay, yet as soon as any Water comes near such Vessels after they are burnt, both the Chalk and Marle will slack, and so spoil their Ware.

There is a Sort of Marle in *Derbyshire*, which tho' it has a great Quantity of Sand in it, yet is very fat; and is so short, that if we wet it we cannot work it into a Ball, or make it hold together. This kind of Marle is of great Use upon Clay Ground; as it is of a hotter Nature than commonly Marle is, and of a more opening Quality.

Tho'

Tho' some Marles are fat, and something more opening than other Sorts; yet they are, for the most Part, of a cold Nature, and will be restrain'd from acting, by the Weight of the Clay, and therefore suits best with hot light Land: But as there is no Rule without an Exception, so where Marle is not laid too thick, nor is of a too binding Quality, it will sometimes be helpful to Clays, especially when we design them for Grazing Ground; for in the suiting the Marle to the Land lies the chiefest Advantage; and therefore, the surest way to know the Value of our Marle, is to try a Load or two upon each particular Sort of Soil, and to lay it upon them in different Proportions.

The Cow Shut, or Stone Marle, is generally found under Clay, or low black Lands, seven or eight Foot deep. Clay, or Steel Marle, is sometimes found under sandy Land. But in Clays, it seldom lies above a Yard deep, tho' under Sand it lies much deeper.

The *Sussex* Marle is generally found near the Bottom, or about the Middle of hanging Lands.

In the digging of Marle there are commonly used Pick-Axes, Spades, Shovels, and Barrows; or else, where the Pit is broad, and has an easy ascent, they use small Carts, which are about five Foot long, two Foot three Inches wide, and fourteen Inches deep, made in such a Manner, that a Load of Marle may be easily shot out of them. The Number of these Carts must be in Proportion to the Distance that the Marle is to be carried. There are commonly three or four Hewers, or Diggers, to four Fillers, or sometimes more; so that the Fillers may be constantly kept at Work; and to each Cart there must be a Driver and a Setter; the Office of the Setter is to shew where the Marle is to be laid, and to assist in the unlading of it. Some

Sorts of Marle requires a Carrier of Water to soften it for the Workmens Shovels; and if there are Springs, as there often happens in Slate Marle, there ought to be Pumps to carry off the Water.

There is a Sort of Carriage in *Lancashire*, with thick Wheels, which they use for bringing their Marle out of the Pits, which is drawn with one Horse; this is not so heavy as a Cart, and does not poach the Way so much, because of the thickness of the Wheels,

Marle, is supposed by some, to be full of Fertility, from its Salt and Oily Qualities; the Salt, they reckon, is contracted from the Air, and therefore believe, that the longer the Marle is exposed to it, the better; for which Reason, they esteem it the best Way to lay it upon Grass Grounds three or four Years before they break them up; and when they cover the Land with Marle, not to plough above an Inch and half into the Soil, that they may not bury it, because it is apt to work downwards. But some Farmers are of a contrary Opinion, and chuse to plough it in deep as soon as spread; believing, the Sun wastes the Fatness of it; which may be the right Way of ordering the *Sussex* Marle, and the other the right Way of ordering the *North* Country Marle; because, as we observ'd before, the *Sussex* Marle is the fattest, and that the Way of ordering of Marle should be according to the Nature of it; for the Discovery of which, there is nothing like Experience; and it is for the same Reason, that they lay Marle upon hard binding Grounds, in *Sussex*, the Beginning of Winter; and on Lands of a contrary Nature in *May*, about *Staffordshire*. Good Marle, in hot Weather, will flack with the Heat of the Sun, and the Help of the Dews, as Lime does, but especially if any Rain happens to follow a hot Day.

Marle is harrow'd in, by some Farmers, just before they plough it; which Method mixes it equally with the Earth; and we may take Notice, by the by, that Cole Seed, Clover, and any Sort of Grass Seed, grows well on Land that has been well marled.

It is the Way, among some People, to try their Marle, by putting it into a Glass of Water, and if it is so tender, as that it breaks as soon as the Lumps come to the Bottom, it is then esteem'd good, or else not. Again, if it sparkles in Water, and feels fat between the Fingers, 'tis a Sign the Marle is good. But the surest Way is to try it abroad, in Wet and Frost, whether it will dissolve, for then we may be sure it is good.

All Grounds which are seated on Marle, are commonly very rich, although they are somewhat heavy and cold; in such a Case we need not doubt the Depth of the Soil; and the deeper we turn up such Soil, so much the better it will be; for by exposing it to the Air it will be very much meliorated, and especially if we help it with a little light warm Soil.

When we have a Design of marling any Land, we must be careful to consider the Proportion of Marle which our Land requires; always remembering, that 'tis dangerous to lay on too much, and that we had better err on the other Side; because if we should lay on too little, we may add more at Pleasure. It is also an Observation worthy our Notice, that Marle does not improve Ground so much the first Year, as it does the second.

It is the Method in *Staffordshire*, to lay two hundred Load of Marle upon an Acre, which is full enough, except 'tis upon a black loose sandy Mould, or a Ground that is much annoy'd by Worms; on such Lands they lay three or four Hundred Loads upon an Acre, believing they cannot be marled too much. 'Tis a common Obser-

vation, that where the Mould is thin, the Marle must be laid thin; and where there is a deep Mould, the Marle must be laid thicker, in Proportion; though there are some Lands which are only improved by Marle, as it makes an Addition to the Depth of the Soil; and they reckon, that if they can marle an Acre of Ground for fifteen Pounds, it will turn to good Account; and indeed, when we are about manuring any Ground, 'tis much the best to lay on our full Quantity of Manure at once, for then it will last Time out of Mind; but 'tis flinging Money away to dung or manure Grounds by Piece-meals; for the Quality of the Soil soon overpowers any Manure, where it is only laid upon it in small Quantities.

It is the best Way to sow marl'd Land under Furrow, for if it is well husbanded they will mellow; the rougher these Lands lie, the better, because the Lumps will dissolve with the Frost, and fall to Pieces, and by breaking, will help to cover the Roots of the Corn.

If our Marle should happen to be of that Sort that will render Land stiff and binding, we must lay Dung upon it, and lay it down for Grass.

Flat Lands are best to be marled; for upon the Sides of Hills, if the Marle be good, it will wash away with the first Rains. These Sort of Lands should not be ploughed when they are too wet, because it is apt to make them be too poachy, they should be plough'd three or four Years, and then to lay them down three or four Years for Grass; for great Care must be taken not to let them lose their Heart by ploughing; because, after the Ground is marled, and laid down for Grass. if it is in Heart, it may be improv'd by Marle again, after it has been fed for several Years; but if it has lost its Heart, it can never be again improv'd by Marle: And we must observe, that when we design to lay down marled Land, we
must

must dung it well, or Sand it, the last Crop, because it opens the Land, and makes it much more fruitful, especially in natural Grass, or Grass Seeds; and by this Practice Marle will last good thirty Years, upon many Sorts of Lands.

The Method used by the Farmers in some Counties, when they have marled their Lands, is to order their Crops in the following Manner. After the first Crop of Wheat is cut, they plough in their Wheat Stubble in *December*, and if they have the advantage of frosty Weather, to mellow their Ground, then they do not plough it any more 'till *April*, and then sow it with Barley, allowing three Bushels of Seed to an Acre, the Produce of which is commonly thirty Bushels. The next Crop, which is to follow the Barley, is Pease, for which they plough but once, in *February*, allowing three Bushels of Pease to an Acre; and after the Pease are off, if they design six Crops, they sow Wheat again, and the fifth Crop is Barley, and the sixth Year's Crop is Oats. Some Farmers will take off two or three Crops more, if the Ground be well marled; but 'tis better to be avoided.

Markham tells us of four Sorts of Land in the Wolds of *Kent* and *Suffex*, which are improved by Marle; the first is an hazel Mould, which he advises to be plough'd up as deep as possible, even to the dead Earth, and to lay upon every Acre of such Land, five hundred small Cart Loads of Marle: This Land they sow with Oats, upon a Lay, to kill the Grass; or else they Marle it in *May*, and then give it a Summer fallowing, and sow it that Winter with Wheat, and the next Year to sow it with Pease, sowing them early; and then with Wheat again, if it has been a moist Summer; but if the Summer is dry, then they fallow it again, before they sow their Wheat; allowing two Bushels of Wheat upon an Acre,

which is the outside of what they allow to be sown, because if it is sown thick, the Straw will be slender, and the Ear small, which will be subject to be beaten down by the Wind. In *February*, he should have the Wheat fed with Sheep, which will settle the Earth close about the Roots of the Corn; and after that, rolling it will be of great Advantage to the Crop. When we have had two Crops of Wheat, he advises to lay it down for Grass five or six Years; and if it grows Mossy, or is over-run with Broom, which these Lands are inclin'd to, we must then break it up again, and order it as we did at first, laying it down again from the Wheat Stubble; and thus being alternately sown, and rested, the Land will last good thirty Years; whereas if the fertile Juice of the Marle be spent, by often sowing of it, and exposing of it to the Air and Sun, as some suppose, it will remain a dead clod, which will not be capable of mending with fresh Marle.

The second Sort of Land, which he mentions, is what he calls Marle Cope Ground, which is a kind of cold wet Clay, and not properly to be marled for any Corn, unless black Oats; unless where it is fleet for Pasture. These Lands, he tells us, must be plough'd fleet, lest the Marle be drown'd with the wet; but if we have good Drains, or such Ground lies any thing dry, it may then be sown with Wheat.

Three hundred Load of Marle, he reckons, is sufficient for an Acre of such Land; and two Bushels and half of Wheat, he allows for sowing an Acre, which has been thus marled; this must be sown above Furrow, about fifteen Days before *Michaelmas*, and should be laid up in high round Ridges; these Lands, likewise, may be well mended with Durg, and dry light Earth: But, I think, the best Improvement of such Lands, is to lay them
down

down for Grafs, which the Marle will make very sweet for eight or ten Years, 'till the Marle is got so low that another crust of Earth is grown over it, and then it may be plough'd up; but then there must not be above a Crop or two of Corn taken from it, before it is laid down again for Grafs. When we fallow these Lands, we must always do that Work in a dry Time.

The third Sort of Land is sandy and gravelly, which must be order'd much like the hazelly Soil before mentioned; only, that these must have more Marle laid upon them, and must not be so often plough'd. These Lands should be plough'd pretty deep, that the more Marle may be laid upon them, 'Tis common to allow five or six hundred Loads of Marle to be laid upon an Acre of these Grounds, which they sow under Furrow, about *Michaelmas*, allowing two Bushels and half of Wheat to an Acre, leaving the Ground as rough, and full of Clods, as they can; and when they have reap'd a Crop from them, they fallow them, and sow them again with Wheat; for as yet they do not think them qualified to bear good Pease: This being done, they let them rest for four or five Years; if it happens to be overrun with Broom, they cut it, or pull it up, and after that sow it with Oats, and fallow it the Year following, and lay three or four hundred Load of Marle upon an Acre, and order it like hazelly Ground; which Manure will keep the Ground in Heart upwards of thirty Years. If the sandy or gravelly Soils are wet and springy, it is best rather to marle them for Grafs than Corn, and then to lay five hundred Load of Marle upon an Acre. It is the Opinion of some, that to burn Marle, and lay it upon the Land, will be of great Advantage, for that sixty Load of burnt Marle, will go as far in the enriching of Ground, as three hundred Loads not burn; but we

we are not told what Sort of Land this is fit for, nor what Sort of Marle we should use: However, it is reasonable to suppose, that the Land they mean, should be a Sort of stiff Clay, for the burning of Marle will make it become open in its Parts, which will be good therefore for stiff Ground; but by no means for light Lands, whose Parts are too open already; and it seems, that the Marle which is most proper for burning, is such as most resembles Chalk, or is the fattest and the heaviest, for such as will fall by Frosts, will fall by Heat.

The Earth call'd Fullers Earth, though it is commonly of good Account to the Owner, for several Uses; yet where there is a good Fund of it, it would be of good Use to lay upon Lands, for it contains such Parts and Qualities which are found in the richest Marles; therefore will serve to help Lands, where other Manures are hard to be got.

After these Sorts of improving Earths, come the Clays, which, however they may be barren of themselves, will serve to mend other Grounds of contrary Qualities, as those other lighter Grounds are often used to improve the Clay Lands. I have already spoke of the several Sorts of Clays, so that it remains only to explain how they may serve as Manures to Land of several Sorts. The Grounds which are chiefly improved by Clays, are such as are light and sandy, or gravelly, the Clays making such Grounds become more solid and tenaceous, and likewise are useful by allaying the Heat of sandy and gravelly Soil; nor does the Parts alone of the Clays contribute to fix such light Grounds, when they become well mix'd; but the viscous Quality in the Clay, being, by degrees, wash'd by the Rains into the sandy Ground, assists in uniting and binding the sandy Parts together.

This

This we may observe, in a great Measure, if we bury a load of Sand in a stiff Clay Ground, and cover it about a Foot thick with Clay, the Sand will, in a Year or two, be so impregnated with the viscous Juices of the Clay, that it will be tough, and its Parts hard to separate, almost as those of the Clay; and these Clays, all of them, possess the Qualities of Marle, only they are so bound up, in some of the Clays, that they cannot act; and therefore, as the Sand, and sharp gravelly Soil will open these Parts, when they are not overpower'd with the Clay, then the Clay will act to as good Advantage as Marle. Many are of this Opinion, but yet Custom prevails so much over them, that it is seldom made use of, unless in some sandy Places in *Yorkshire*, where it turns to good Account; as it would do any where else, if it was try'd: At *Tolleshorp* especially, which stands upon a light sandy Soil, the Farmers chiefly use Clay for their Manure, which they dig from the declivity of a neighbouring Hill; their Clay is of a bluish Colour, and is close and fat, and very weighty; they commonly lay an hundred Load upon an Acre, which they carry upon their Lands about *Midsummer*; and it is observable, that for three or four Years after it is laid upon the Land, the Clods will remain unbroken; and that the first Year they lay it upon their Land, it brings a rank ill colour'd Barley, but the second Year, it brings a fine rich Grain; this manuring with Clay will last forty or fifty Years, and then may be again assisted with fresh Clay, as the People of that Country Experience. This sandy Land, unless it be clay'd, they observe, will bear nothing but Rye, though they Manure the Land with other Manures; but being once clay'd, will bring good Oats, Barley, and other Corn and Pulse.

Before

Before I conclude my Remarks upon this Chapter, I shall take notice of a Method of improving of Land, which yet has not been touch'd upon in this Work; and that is, by sowing of Rape and Cole Seed, which is an excellent piece of Husbandry, and Improvement of Marsh and Fenny Grounds, newly recover'd from the Waters, or any Lands which are rank. The best Seed is the largest, and of a clear Colour, like the best Onion Seed; it is usually brought from *Holland*, but we have some which is very good that grows with us; it must be kept very dry, or else it will be apt to mould. I have observed, that when this Seed has been raised upon dry Ground, (for it will grow very well upon dry Land) the Seed has done better when it was sown upon the Marsh Land, than that which came from *Holland*; for it is rare to have more than half the Seed that comes from abroad come up, it is so apt to be injured by the least Damp. *

The properest Time of sowing it, is a little before *Midsummer*, or it will not be too late if we put it in the Ground in *July*, but the sooner the better, if the Ground has been fallow'd as it should be; that is, first fallow'd or plough'd in *May*, and fallow'd again in *June*; at which Fallowing, the Ground should be made very fine, and even before we sow the Seed, which Work of sowing should be done the same Day the Land is plough'd; about a Gallon of Seed will sow an Acre. It is sown for two Uses, either for Seed, or for a Winter Fodder for Sheep or Cows; that is, in *January*, *February*, and *March*, when other Food is wanting. It turns to very great Advantage, even in the worst of these Grounds; but what we design for Seed, should be that which grows upon the richest Grounds, for there it grows the rankest and the strongest.

If the Winter be mild when we Feed it, it often brings a good Crop the second Year; and when it has been cut, it quickly sprouts again, and yields an excellent Food for Sheep; only Care must be taken, when our Sheep are first turn'd into it, that we put them the first four or five Nights, into some common Grass Grounds, because Cole is apt to swell and fill them with Wind, as Clover does, 'till Cattle are a little used to it.

If we cultivate our Cole for Seed, we must cut it when one half of the Seed begins to look Brown, and then it should be reap'd, as we do Wheat, laying it in Parcels of about two or three Handfuls together, to dry, which commonly takes up about a Fortnight's Time; during which it should not be disturb'd, lest we shed the Seed, which it is very apt to do; and therefore, when they gather it, they do it carefully into large Sheets, in which they carry it to the Barn, and Thrash it out immediately: But in *Lincolnshire* they commonly thrash it in the Field, upon a large Sheet, having under it levell'd a Piece of Ground for that Purpose. The common Produce, upon an Acre, is five Quarters, which is worth about five Pounds in the Market, or twenty Shilling a Quarter.

The Use of this Seed is to make Oyl, as I shall explain by and by. This is a very good preparer of Land for Barley and Wheat, by taking out the too gross or rank Juices of the Ground; but in some Places they rather chuse to sow Oats after the Cole.

After the pressing of the Oyl out of the Cole Seed, the People in *Lincolnshire*, where Firing is scarce, burn the Cakes for heating of Ovens, and other Uses; but in *Holland* they make a much better Use of them, which is, to feed their Cows with,

with, in the Winter, when other Food cannot easily be had. In *Northamptonshire* they mix the Powder of these Cakes with Water, and give it to their Calves, after they are three or four Days old, instead of Milk, which agrees very well with them, 'till they come to eat Grass, or Hay. But if we use them when they are broken, to lay upon Land, they enrich it extremely.


I shall take this Opportunity likewise of mentioning the Improvements which are made about *Devonshire* and *Cornwal* with *French Furze*, which they sow there in great Quantities for Fuel; they chuse the worst Land they have for it, and in three or four Years Time begin to cut it; it is of that Nature, that it burns as soon as 'tis brought from the Field, and is excellent for burning of Stock Bricks. I have seen some of these Furze above twelve Foot high, but it is seldom they are suffer'd to grow so tall; for when this Crop has been upon the Land about six Years, they cut it, and burn the Ground in order to sow Wheat upon it, which they do after they have spread the Ashes, and plough'd it lightly over. I am perswaded, this Sort of Furze would do well in *Lincolnshire*, upon some of their Skealy Grounds, and would turn to better Profit than what such Grounds are put to at present; for where Firing is so scarce as it is in *Lincolnshire*, this Crop would come to a good Market, and stand the People of that Country in good stead, 'till they could have fire Wood grow up; which I suppose now they will begin to Plant, since they have already drain'd so much of the Fen, and are still gaining more and more Ground every Day from the Sea, and that is generally of such Sort as has all the Appearance of rich Qualities in it, for the Nourishment of any Sort of Vegetables: Besides, the Advantage they will receive

receive from these rich black Lands, by mending their Uplands with them, which may be done at an easy Rate, if they contrive to make Navigable Canals, to have a Communication one with another, as an ingenious Gentleman has already set them an Example. But these wet Lands must have some Time to come to themselves, and be brought into Temper by Degrees, and by leading them gradually into the Way of Vegetation, by sowing such Crops; at first, upon them, as will take off their too great Rankness.



C H A P. XVI.

Of the Cythifus, its Use for feeding Cattle, and its Manner of Culture, from Columella, Varro, &c. With Remarks.

 H E *Cythifus* is so valuable a Plant, says *Columella*, that a Farmer cannot well propagate too much of it, being the most agreeable Food for Poultry, Bees, Goats, Oxen, and indeed to all Sorts of Cattle; for by feeding upon this Plant, ~~Sheep~~ presently grow Fat; and it is also of extraordinary Benefit to Ewes that suckle Lambs, in making them abound in Milk.

This Plant may be used green for eight Months in the Year, and may be dry'd for the Use of the other four.

The *Cythifus* is a Plant of very quick growth, even in the poorest Ground, and thrives best in the most exposed Places. If Women have little Milk, let them infuse a small Quantity of the
dry'd

dry'd Plant for a Day in Water, and the Day following let them drink about three *Hemina*. Note, the *Hemina* is from the Greek ἡμιον a Measure, containing nine Ounces, so that three of them make twenty seven Ounces. In our Apothecaries Accounts, one Pound is a Pint of it mix'd with a little Wine, and it will give them plenty of Milk.

We may plant the *Cythisus* about the Beginning of *October*, or in the Spring, after having prepared the Ground very fine, and made it into Beds; or if we have a Mind to raise a good Number of these Plants, we may sow the Seeds in *Autumn*, as we do other Fodder, and it may be transplanted the Spring following, at four Foot Distance. But if we have no Seed, set the tender Cuttings, or Shoots of the Plant, in the Spring, in well prepared Ground, raising a little Bank about them, the better to hold the Water we are to refresh them with, which we must take care to allow them a liberal Share of, for the first Fifteen Days, if no Rain happens to fall in that Time.

When the Cuttings begin to shoot, it will be necessary to top them to make them spread, and three Years afterwards they will be fit to cut for the Cattle. A Pound of the Shoots of this Plant, green, is sufficient at one Time for an Horse, and Twenty Pounds for fifteen Oxen; and for the other Cattle according to their Strength.

We may also set some Cuttings of this Plant about the End of *August*, because they easily strike Root at that Season, and will be strong enough to resist the rigorous Frosts.

When we use this Plant dry'd, we must give the less, because a Pound dry is stronger in its Operation than a Pound of the green Plant; before we administer the dry Plant we must first infuse it in Water.

To dry the *Cythisus*, we must cut it in *September*, when the Seeds are near full grown, and expose it a few Hours 'till it wither; then dry it in the Shade, and lay it up.

Remarks upon the foregoing Chapter.

The *Cytisus*, or *Cythisus*, is called in Greek *κυθισος*, so named, as *Pliny* tells us, from the Island *Cythis*, from whence they were brought to the *Greeks*, and from them to the *Latines*, for the extraordinary Fruitfulness it procures both in Men and Cattle; but especially for fatning them, and for promoting Milk in the Females; either to be given them green, or in dry Fodder, However, the Account we have of the particular Sorts which the Ancients used for this Purpose, makes it plainly to be a Shrub. Yet has several Authors supposed it a kind of *Medica*; or some, a *Lagopus*; both which are Herbaceous Plants: But *Columella* and *Varro* make these Opinions to be vain, if we compare their Descriptions with the others.

We have however many Sorts of *Cythisus* in our Gardens, which are all of them Shrubs, and we are yet undetermin'd which is the right Sort: However, this we may be pretty well assured of, that every kind of *Cythisus* has nearly the same Virtue with the rest, tho' perhaps one Sort will act more Powerfully than another.

As to the fixing of the very Sort which was the Favourite of our ancient Husbandmen, I know not better how to do it than in that which is the *Cytisus Galeni creditus maranthæ Cornutus*, or supposed true *Cytisus*, or true *Trefoil*, since it agrees the best of any with the Description we have of the ancient *Cytisus*; this Sort, as *Galen* says, grows to the Height of a Mirtle; or as *Pliny*, and *Columella*, to the Height of a small Tree; but, as *Lugdunensis* says, was taken for no other than the *Medica Lata*;

nata ; but that being an Herb, cannot be the right Sort ; this Sort of *Galen's* growing three or four Foot high, cover'd with a greyish or ash colour'd Bark, and the Wood thereof hard and firm ; the Leaves are hoary white, as is the whole Shrub, and grow without Order, three together, in long scot Stalks ; the Flowers are of a yellow shining Colour, like the Blossom of Broom ; and the Seed grows in crooked Cods. The *Cytisus* is call'd in English, *Milk Trefoil*.

This is so excellent a Plant, according to the Virtues which the ancient Writers ascribe to it, that I should have no small Pleasure of bringing it to use amongst our Farmers, if I could be sure of the right. However, I have try'd two or three Sorts that we have in *England*. and find the Cattle eat them greedily ; so that if we have not exactly the same Sort, yet of those that we have, we might make good Improvement, as well as propagate them for the sake of their Beauty, and Ornament to our Gardens ; they flower abundantly, and very late in the Season, which is the Reason that *Columella*, as well as most of the ancient Writers. prize the *Cytisus* so much for the Service of their Bees. It may not be, perhaps, that the Bees delight more in this Plant than in any other : But I observe, that in *England* those Bees thrive the most, which are cultivated near great Commons. that abound in Heath, or Gorze, or Furze, because the Heath, and Furze, always bring their Flowers toward's Autumn, which is the Time those Creatures collect their Winter Store of Honey : Besides, the Flowers of the Heath are always found in prodigious Numbers at the blossoming Season, and that Season lasts generally ten Weeks, or more ; so there is then no want of Provision for the Bees, where their Colonies lie near large Heaths ; neither can they want any Provision
when

when they are situated near large Commons of Gorze, or Furze, which blossom continually.

I have observed likewise, that when Bees are seated in any Place where there are plenty of Flowers to gather their Wax and Honey from, they have fill'd a common Box Hive with Wax and Honey, in six Weeks. But on the contrary, when the Country happens to be vacant of Flowers, they have not brought their Works to that Perfection in a whole Summer. I have been inform'd, that in some Parts of *Germany*, the People are so industrious, as to move their Colonies of Bees, from Place to Place, many Miles distant from their Home, on purpose to bring them to flowry Places, for the better perfecting their Works before the Time of being shut up for the Winter; for if all is not Perfect before that Time, they must be fed in the Winter Season, or else they will want Provisions, and the whole Colony be destroyed.

But the Heath and Furze being of little use, more than for Firing, besides the Service their Flowers are of to the Bees, one might, much more to the Purpose, cultivate the *Cythifus* which we have been speaking of, for this will be of Use to almost every living Creature about our Farm, even to our Poultry, as *Columella* observes. But he does not in this Chapter go further than to explain the usefulness of it to Cattle.

As for the Culture of this Plant, I find it concordant with the Directions of *Columella*; our Climate, and the *Italian* Climate, make no considerable Difference on that Head, only we should have this in our View, that some Parts of *Italy* are extreme hot in Summer, and are subject to more penetrating Cold in Winter than we are; especially near the Alps, the Cold is very intense in the Winter Months, and when the Snows begin to melt: But our Summers are also very

hot; but then they gently decline into Winter; so that I esteem *England* to enjoy a Climate much more favourable to the Health both of Plants and Animals, than *Italy*, which, on a sudden Start, changes from hot to cold. We find by Experience, that most Plants, which are Natives of *Italy*, or have been naturalized there, will prosper well with us, without Shelter in the Winter; nay, even some Sorts of Plants, such as the Vine, and Olive, have been frequently destroy'd in *Italy* by Severity of Weather; when ours, in *England*, though they have been openly exposed, have felt no ill Effect from our most violent Frosts. The Vines, Olives, &c. which I mention to have have been destroy'd by the Severity of *Italian* Weather, might be spoyl'd by the same Means as any Cattle might be render'd indisposed, by changing their Place, where they had been excited to the greatest Heat, immediately to another extremely cold; the Consequence of which has often been, that they have lost the Use of their Limbs. But when I speak of those Parts of *Italy* which are under the sad Influence of sudden Heats and Colds, I do not go so far as the Kingdom of *Naples*, where, besides the Happiness of a more constant Climate, the Mines of burning Sulphur are like continual hot Beds, to the Plants that grow there.

I may yet add, that besides what *Columella* has mentioned concerning the Propagation and Culture of the *Cytisus*, in this Chapter, we might greatly help the Cuttings of it, in the striking of their Roots, by setting them in Cow Dung, as he observes to us, in the following Chapter of Elms, where he recommends the use of Cow Dung to plant those Trees in, that are removed from one Place to another. What we call Cuttings of a Plant, are only the tenderest Twiggs of any Tree; so we are to suppose, they cannot contain abundance of Sap in them, or such a Quantity as
will

will support them 'till they strike Root, without the Assistance of a good deal of Moisture; and I find by Experience, that Cow Dung in a Body, will preserve such a Moisture as I speak of, a considerable Time, without fermenting or heating; besides, if we consider that the Dung of this Animal is purely from the Leaves of Vegetables, reduced to the finest Particles, we must necessarily conclude, that a Preparation of such a Nature must be preferable to the Dungs of those Animals which feed upon hotter Things, and do not chew the Cud; the Dung of Horses is coarser and drier than the Dung of Cows, in its Parts, and not so fit for the tender young Fibres to pass through, or gather Nourishment from; the Cow Dung, which is a Paste, having in it a viscus Quality, which is always useful to the Growth of Plants; but that of the Horse, besides its Heat, consists of loose Parts, which always admit of every Liquid, such as Water, &c. to pass through it, without leaving any Nourishment in it. I once experienced the planting a Passion Tree in Cow Dung, or rather, as I may say, laying a Load of fresh Cow Dung about the Roots; the same Year the Passion Tree spread its Branches above thirty Foot. So that Cow Dung, in my Opinion, is an excellent Improvement of *Columella's*, in the way of transplanting Trees, to nourish the Plants, and support their Roots 'till they can renew themselves, as well as a grand Necessary for the raising of any Plant from Cuttings.

A late Commentator upon *Virgil's Georgics*, observes, that the *Cytisus*, however famous it was among the *Roman* Husbandmen; or however it was celebrated by the Writers of Agriculture in the *Augustine* Age, and by *Virgil* especially, is not now cultivated in any one Spot of *Virgil's* Country; neither, says he, does any Farmer, or Gentleman,

tleman, know what it is; nor could a few Seeds of it be procured any where in *Italy*, a few Years since, but out of a Garden at *Naples*. Some of it, the same Author observes, is found growing wild, in the farther *Calabria*, towards the Coast of the *Ionian* Shore, where it is fed by Buffaloes; but even there, they do not know the right use of it, and consequently never cut it for the Cattle, as *Virgil* advises, *Tondentur Cytisi*. It is observed also, by the same Commentator, that the Husbandry of *England*, in general, is *Virgilian*, which, he says, is shewn by the paring and burning the Surface; by the Manner of watering Meadows; by the dry Fences; by cross Ploughing; with many more Instances which could be produced. He adds, that in those Parts of *England*, which the *Romans* principally inhabited, all along the Southern Coast, *Latin* Words remain to this Day, among Shepherds and Ploughmen, in their Rustick Affairs; and what will seem more strange, though in Fact it be really true, there is more of *Virgil's* Husbandry now practised in *England*, than in *Italy* itself.

But though the Author above mentioned, ascribes this Honour to *Virgil* alone, we are to know, that *Virgil* has little more pure Husbandry in him, than what the Writers before his Time had given an Account of: He gave indeed a Majesty to their Works, by his lofty Stile, and Musical way of Writing: But I am persuaded, that the Liberty he has taken, as a Poet, has sometimes so confounded his Translators, that they have grafted Trees upon one another, which he never thought on; and given Names to several Plants he mentions, which do not belong to them, or, perhaps, could never have been found out, if it had not been for the Writers a little after his Time; and it is therefore I would advise those, who may hereafter attempt the Translation

nation of *Virgil's Georgics*, to consult *Columella*, and the Authors which *Columella* mentions, before they give their Judgment of *Virgil's Designs* in Husbandry; and then, I suppose, we may expect a compleat Piece, where his Husbandry may be as well explained, as his lofty turns of Thought.

Nor would it be less instructive, to the curious Searchers into these Things, if they were to examine the *Botanick* Authors, where they may trace the several Plants, from the Ancients, to our Time, which the great Mr. Ray has summ'd up, in his *Historia Plantarum*, as far as he had Opportunity of mentioning them. It would be necessary also to enquire into the Culture of Plants, when any one sets forward in such a Design; for without that, the *Georgics* of *Virgil* cannot be well understood.

I hope the Work I am now upon, will not a little open to our View the Sense of the ancient Writers of Husbandry, and help to explain their most difficult Passages.

But for all what has been said, it is very certain, that at this Day there are two or three Sorts of *Cythis* growing Wild in *Italy*, which is fed by the Goats.



C H A P. XVII.

*Of the Reed, the Broom, and the Osier,
from Columella, Varro, &c. with their
Uses in Husbandry. With Remarks.*



THE Reed will grow in any Ground, but prospers best in light and moist Places, rather than in dry Grounds; it is commonly planted on the Banks of Rivers, and Sides of Ponds, than in Fields. When the Ground is prepared, we may Plant our Reed rather with a Crow, or a Dibble, than with a Spade, which will be less Trouble, and more to the Advantage of the Reed.

We may either Plant our Reed from Roots, or Sets, which should stand about two Foot asunder; but Care must be taken not to bury the Tops of the Buds, for they would rot. We may expect our Plantation to fill the first Year; but we must not cut any of our Reeds 'till they have done growing, and the Winter has harden'd them.

When our Reeds have stood so long upon the Ground, that they make small Shoots, we should either dig up the whole Piece, and replant it, or else thin the Crop, by cutting up the Roots, where they grow too thick; and burning these, upon a proper Place, we may use the Ashes as a proper Manure to the Reed that is left standing. When we make this Castration, or thinning of our Reed Ground, it should be done before the Reed is cut down, for then we shall be able to judge which Roots are the most decay'd, and which are strong enough to be left for a Crop,
which

which cannot be well known after we have cut our Reed.

The Season for new digging and planting of Reed, is before the Buds of the Reed begin to shoot, or just after we have cut our Reed.

When we break up an old Reed Bed, it is a common Rule to burn the Ground with the Stubble, which will bring the Piece into good Strength for a fresh Plantation.

Those Places which are too dry for the Culture of almost any Plant, are the best for Broom; upon such dry Ground its Twiggs are very strong and tough.

It is raised from Seeds, which, when the Plants come to be two Years growth, we may transplant many of them, leaving the rest at proper Distances; which, the third Year, may be cut close to the Ground, like Corn; and such cutting repeated every Year afterwards.

But for other Works of greater Strength, in tying or binding of Plants, there are used the Rods, or Twiggs of Willow, and other Plants which produce strong Withs, and will grow in poor Soils. The Willow chiefly prospers in wet Lands, and is propagated by setting the Twiggs; which, as soon as they have branched, should be cut down, and the Plants reduced to one Stem a Piece, and the Ground about the Plants dugg and weeded. Nor should these Willows be less cut than Vines, that their Shoots may rather extend themselves in Length than Thickness.

With this Management we may cut a full Crop the fourth Year after planting, off the Shoots, within half a Foot of the main Stem; so that the Plants may shoot, and spread in Branches like a low Vine.

After the fourth Year we may reap a Crop of these Twiggs every Year, if the Land be wet; but if our Plantation be upon dry Ground, then
we

we had better let our Twiggs stand two Years before we cut them.

The Sorts of Willows commonly used are the *Greek Willow*, the *Galic*, or *French Willow*, and that which is call'd the *Sabina*, or *Amerina*.

The *Greek Willow*, says *Columella*, is of a yellow Colour; the *Galic*, or *French Willow*, brings very small Shoots, of a deep Purple Colour; and the *Sabina*, or *Amerina*, has succulent Shoots, which are of a reddish Colour. Thus far our ancient Writers of Husbandry, of Withs and Rods, &c. for tying, binding, and staking of Plants; but chiefly for the Use of their Vineyards. I shall now begin with my Remarks, and first of the Reed.

The Reeds, which are here mentioned by *Varro* and *Columella*, are design'd by them for the use of the Vineyard; the Leaves we find, by them, are used for tying of the most tender Twiggs, or Shoots; and the Stems, or Canes of them, for supporting of young Plants; which Services of the Reed is now common in *Italy* and in *Spain*: But 'tis not our small Reed which I speak of, but that Sort which the *Spaniards* send us over, and is commonly used for Fishing Canes, which, I suppose is the Sort of Reed which our ancient Writers recommend to us. This Sort of Reed, or Cane, is call'd *Harundo*, or *Arundo Donax*, and commonly with us the *Spanish Reed*, or Cane; it shoots forth from the Root with many great round hollow Stalks, full of Joints; growing to a great Height, even to seventeen Foot, as I have seen them when they have been the most Vigorous: The Leaves which come at the Joints, are broad towards the Joints, and grows narrower 'till they end at a Point, being commonly about a Foot and half in Length, and sometimes two Foot; on the Top of each Cane appears a soft brownish Panicle, with chaffy and downy Seeds; the Joints of
this

this Reed are sometimes a Foot asunder, and very strong and stiff, and able to support Plants of some Strength; the Root is very hard, round, and long, upon which are many Knots, which produce Buds for Encrease.

I have raised of this Sort of Reed, or Cane, in *England*, that has shot thirteen Foot in a Summer; and I find, that if it be cultivated in a Soil that is agreeable to it, it will do as well with us as our common Reed; therefore it surprises me, that it has been so long neglected as it has been, and that we have not now-a-days as great Plenty of it as we have of the small Reed.

The next Plant taken notice of in this Chapter is the Broom, whose Twiggs were used for the tying up of the more stubborn Shoots of Plants, and indeed is so useful for that Purpose, that I wonder we have not apply'd it to that use in *England*; for though our *English* Broom does not shoot so long in its Twiggs as the *Spanish* Broom, yet are the Shoots of our Broom long enough to be useful for many Things, and very tough. But I am to speak of that Sort of Broom which was used by the *Roman* Husbandmen, which was undoubtedly that which we now call the *Spanish* Broom, or *Spartum Hispanicum frutex vulgare*, which Plant grows to be five or six Foot high, or more, with a woody Stem near the Root, cover'd with a dark Grey, or Ash colour'd Bark, shooting forth many pliant, long and slender green Twiggs; whereon, in the Beginning of the Year, are set many small and somewhat long green Leaves, which soon fall off.

Towards the Tops of these Branches grow many Flowers, which resemble those of the common *English* Broom, but larger, and more spreading and shining; they are of a golden Colour, and are very sweet scented: These Flowers are succeeded with small long Cods, crested at the Back, wherein

wherein is contain'd blackish flat Seed, fashion'd like to Kidney Beans; the Root is woody, dispersing itself several Ways under Ground. This Plant has been hitherto only cultivated in our Gardens; but seeing it wants no Care, I think our Farmers might as well have it grow in their Fields, as our common Broom, since it is raised so easily from Seeds, and will prove so useful in many Works, but chiefly because it is so strong a Shooter. This Sort is also call'd *Genista Hispanica*, & *Spartum Græcorum*, & *Spartum frutex*.

I come in the next Place to consider the several Sorts of Willow and Sallow which were used by the *Roman* Husbandmen; the first Sort mentioned is the *Greek Willow*, which *Matthiolum* takes to be the *Salix angustifolia purpurea seu nigra*, or ordinary black Willow: But this does not agree with *Columella's* Description of the *Greek Willow*, who says, it is *flavo colore*; therefore the *Greek Willow* I take to be the same which we have with us, under the Name of the *Dutch Willow*, whose Shoots are of a fine golden Colour, and easy to bend, like our common Osiers.

The *Galican*, or *French Willow* of *Columella*, is, he says, of a deep Purple Colour. This I take to be his *Viminalis*, and the *Purpurea* of *Pliny*, and *Cortice-nigro* of *Theophrastus*, especially since *Columella* says, it brings slender and small Shoots.

And as for the *Sabina*, it is plain, from *Columella*, that it is the same of the *Amerina*, which is our common Osier, as *Lugdunensis* tells us; the Plant, says he, which the People about *Paris* call Osier, is call'd by the People of *Lyons*, and the Mountainers in *Savoy*, *des Amerines*: Which traditional Account I prefer before many other Accounts which are printed of these Things; and this, says *Columella*, shoots forth succulent Twiggs, or Rods, which are of a reddish Colour, answering to our common Osier. These are all of them for

tying,

tying, or binding, and are so used with us, besides the making of Basket Works, for which use they turn to good Profit, even so much, that an Acre of good Rods, or Withs, will bring more Money than an Acre of Wheat. This Osier is call'd, by our Modern Authors, *Salix aquatica humilis*.

The *Salix viminalis nigra* has very slender Branches, fit for winding, or twisting, of a dark red Colour; the Leaves are long and narrow, dented about the Edges, of a dark Green, and a little White underneath, having two small round Leaves at the setting on of every one of the long Leaves, which distinguishes this Kind from the rest.

The Osier is always left with a Stem, about a Foot above the Ground, from whence the Shoots or Wands rise, which are cut every Year for Use; the Bark whereof is a little enclining to yellow in some, and in others of a reddish brown Colour; the Leaves are long and narrow, and dented about the Edges, dark Green on the upper Side, and whitish underneath; this is not observed to bear any Flowers, because all the Shoots are lopt off every Year, close to the Head. The Rods being planted into the Ground, will grow to be Trees, and must be cut down Yearly.

But, besides these, we have many more Kinds in *England*, the common white Willow, the black Willow, and the hard Black, the Rose Willow the round long Sallow, the longest Sallow, the crack Willow, the round ear'd shining Willow, the lesser broad leav'd Willow, the Silver Sallow, the upright broad Willow, the lesser Willow, the creeping broad leav'd Willow, the Willow-Bay, and some others; the most useful among which, I shall mention for the Use of my Brother Farmers.

The Withy makes a large Tree, and is fit to be planted on Banks and Ditch Sides, so that it may be within the Reach of Water. or upon the
moist

moist Side of Hills, for these extend their Roots deeper than either Willows or Sallows. We plant this Sort at twelve Foot distance; and though they grow the slowest of all the twigg'd Trees, yet it recompences by the Crop that it brings. The Wood is tough, and will bind with Strength, and the very Peelings, or Rind of the Branches, is useful to tye Arbour Poles together, and are fit for Vineyards, Espalier Fruit, and such like. There are two principal Sorts of Withies, which are the hoary and the red Withy; which last, some would make the *Greek* Sort; it is the toughest, and its young Twiggs are more flexible than any other.

After these are the Sallows, which grow much faster if they are planted within reach of Water, or in a very Bogg or Moor, or where the Soil, by reason of too much Moisture, is unfit for Ploughing, or Meadow, for in such Places it is an extraordinary Improvement, and will grow in any Place where Birch and Alder will grow.

Before you Plant them, it is best to turn the Ground with a Spade, especially if your Ground for them be upon a Flat. We have one more Sort of Sallow than the Ancients mention, who name only the Black and the Yellow: Our third Sort is of a different Colour from the other two, having the Twiggs reddish, and the Leaf not so long, and of a more dusky Green, more brittle whilst it is growing in Twiggs, and more tough when arrived to a competent Size; all these however are useful in Thatching.

The hooping Sallows are in great Esteem for their clear terse Grain, and requiring a more succulent Soil; they should be planted a Foot deep, and a Foot and half above Ground, although some allow but a Foot; these will produce excellent Branches for Sets. These, after three Years growth, will have the first Years Increase about
ten

ten or twelve Foot long, and strong enough to make Pike Staves, or Rakes.

If we plant these at the full Height, as some do, at four Years growth, they will be less useful for strait Staves, and for Sets, and be of slow Growth; but yet will turn to good Profit.

These should be planted at five Foot distance, in a *Quincunx* Order; and if they like the Soil, their Leaves will grow half as large as a Man's Hand, and of a lively Green, always larger the first Year than afterwards. Some plant them sloping, and cross ways in Hedges; but this hinders their Growth; and they never make a good Fence.

If some of these Sallows are suffer'd to wear their Tops for five or six Years, their Catkins will be of extraordinary Benefit to Bees, even appearing before other Flowers. The hooping Sallows bring their Catkins before the others; and when they are blown, which is about *May*, their Palms yield a very fine Down, or Cotton. There is one Sort which brings so much of this Sort of Down, that 'tis reasonable to think, it might be converted to some extraordinary Use.

Of the hooping Sallows, they will, at three Years standing, yield upon each Plant about twenty Staves, of eight or ten Foot in Length.

One may plant Sets of one Years Growth, but those of two Years are best, and those of the third Year better than the second; especially if we plant them near Water, upon a Bank: For Example, within a Foot of Water, or else altogether immers'd in Water.

'Tis good to new earth these the second Year, though few take the Pains to do it, no more than to dig about them three Times a Year, as the ancient Writers of Husbandry advise. For to set down all they direct concerning this Plant, they would require as much Culture as Vines: But
that

that particular Care recommended by the Ancients I have omitted, because I see, in our Climate, it is not wanted.

Sallows may also be propagated by courbing, or laying, like Vines, and covering some of their Parts with Mold.

For Sets, those are to be preferr'd which grow nearest to the Stock, and so consequently those are the worst which are taken near the Top of the Tree; they should be planted in the first fair Weather in *February*, before they begin to bud; but this planting about *London* is commonly done about *December*, if the Weather be open. We may cut them in the Spring for Fuel, but best in Autumn for Use; but in this Work leave a Twigg or two, which, being twisted Archwise, will bring plenty of Shoots, and speedily make an Head.

When we plant Coppices, we should set about one in five of this Sallow among the other Plants, which would sufficiently recompence our Trouble; therefore when we cut up Trees, thrust in Truncheons of Willows, or Sallows, in their Place; and if the Ground should be naturally dry, yet the Moisture of the Air in the Coppice, and the Shade of the Trees, would yield such a Share of Nourishment to these Plants, that they would thrive very much, as I have experienced.

It is reported, that there is a Way of grafting a Sallow Truncheon so as to make it bear Fruit; but not having had the Experience of it, I can do no more then mention it, to be tried by the Curious. I am of Opinion indeed, that there is such a Plant in Nature, as one, upon which any Tree may be grafted; and I am apt to think, if ever it be found, it will be among the Willows, or Sallows, or some spongy free growing Plant, which seldom brings Fruit, or of a very indifferent Kind. However, in the Case before us,
which

which tells us to provide a Truncheon of Sallow a Foot and half long, as big as one's Wrist, and to graff at both Ends a Fig and a Mulberry Cion of a Foot long, and without claying, to set the Stock so far in the Ground as the Plant may be three or four Inches above the Earth; this, some tell us, will grow extremely the first Year, and in three Years be fit to transplant. The Season which we are told is fit for this Experiment, is in *February*: That the Fig and Mulberry have a Harmony in their Juices, as the Ancients have told us, is evidenced by the grafting one upon the other, by Mr. *Whitmill*, a very curious Gardiner at *Hoxton*.

Osiers, or the lesser of the *salix* Kind, have vast Varieties, they are distinguish'd from Sallows, as Sallows are distinguish'd from Withies, being much smaller than Sallows, and shorter liv'd, and also requiring more constant Moisture; but yet should be planted in rather a dryish Ground, than in such as is over moist and weeping, which we frequently redress by cutting of Trenches; these also yield more flexible and limber Twiggs than the others, and are fit for Basket, Cage, and Lettice Work.

But these Sort of Osiers should be cut in the new Shoots, for if they stand longer, they become more inflexible; they should be cut according to the modern Method, close to the Head, in *October*; unless one will stay 'till the Frosts are past, which I think is the best; and yet the People near *London* cut them in the very coldest Seasons, and those which do not observe this Custom are accounted ill Husbards. At the Time of cutting the Twiggs they are to be bundled up, and lay'd in Shelter, if we design to work them into rough Baskets; but if we design them for what is call'd white Work, we must then set their Ends in Water, for indeed, the peel'd Wares of the *Vi-*

minious Kind cannot otherwise be kept from the Worms. The Peelings of these Ofiers, as well as the Twiggs themselves, are of use to the Gardiner, and are no less serviceable to the Cooper.

We have in *England* three or four Sorts, which are call'd Ofiers, one of which is of little worth, because its Twiggs are brittle; it has reddish Twiggs, and more green and round Leaves than the others. This is the *Amerine*.

The Ofier which is call'd the Perch, has very limber and green Twiggs, with very slender Leaves; and another with the yellow Twiggs, which, I said before, was the *Greek* Sort. But the Basket-makers about *London*, who chiefly use the Twiggs of these Plants, in framing of Wicker Works, give them different Names, as they are of different Species, and make great Varieties of them, planting every Sort by itself, and have a particular Use for every Sort; they have the hard Gelster, the Horse Gelster, the shrivel'd Gelster, and the black Gelster, which grows plentifully in *Suffolk*; and the hard Goldstone, the soft Goldstone, which are said to be the worst of the Goldstones, from their being the most brittle: Next to these is the sharp and slender topp'd yellow Goldstone, and the fine Goldstone; and after these the yellow Ofier, the green Ofier, the speckl'd Ofier, the Swallow Tail, and the *Spanish* Ofier; and also the *Flanders* Willow, and white Sallow, may be added to them, because their Twiggs are commonly put to the same Use; however, these two last Sorts grow to be large Trees, yet will bear cutting as constantly as the Ofiers; 'tis of these Sorts the Coopers generally tie their Hoops: These are the Names of them, given by the Basket-makers. They may be all raised from Cuttings, as I have observed before; but as the Cattle are very voracious of their Leaves, and tender Shoots,

we must be sure to keep all Cattle from coming near them. Some advise to graff them upon Sallows, out of the reach of the Cattle.

In *France*, upon the River *Loir*, there are many Plantations of these Osiers and Withies, where they are perfectly understood, and are both there, and in other foreign Parts, raised from Seeds, which are contained in the Catkins; they sow these in Furrows, or shallow Trenches, and they spring up like Corn in the Blade, and become so fine and tender that they are frequently cut with a Sythe: They will also do this Way in our Climate; but they must be carefully kept weeded, or else they will come to little.

These are found to be of very great Value in *England*, and require the least Trouble in the Culture of them of any Plant; and then their Crop is sure and certain; there is no Hazard, as in Corn and Pulse, or Hay, of being spoil'd by the Weather; but at the Time of Year we cut it, and may have the Value of it in Money, while our Osier Ground, without further Trouble, is preparing to provide us a plentiful Harvest for another Year; nor are these Benefits unregarded in the purchasing of Estates, but are valued accordingly. We may consider likewise how easily these are renew'd, if a Plant, by any Accident, happens to miscarry, only by sticking in a Twigg from one that is next at Hand. With this kind of Husbandry, Land which was worth only ten Shillings an Acre, has been made worth twenty Pounds *per Annum* for ever, as one may say; and some Land which has been so poachy that it produced no Profit at all, has been made worth as much. If a Man was to sit down heartily to consider how many Ways there are to improve Ground, and not be tacitely drawn in to sow Corn upon his Ground, because his Husbandman tells him it must bear Corn, or another Piece must bear Grass, and this

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will

will bear nothing, and that will never be brought into Order; I say, this is not the Way to thrive upon an Estate; for I affirm, there are those Crops which will yield more Profit than Corn, and be less Expensive, and that above half the Lands in *England*, at this very juncture, are managed contrary to their Nature; and then for Land being good for nothing, or in other Terms, being so bad that 'twill produce nothing. There is no such Land in Nature, but from such Observations as my Reader may observe in this, and my other Books of Husbandry, he may find some Plant or other which may be profitable to every Sort of Land, or some Help to the worst Land, even so as to bring it to bear Corn, if nothing else will be agreeable to him. But to omit nothing of the Culture of this Plant, the Ancients would have the Ground trench'd a Foot and half deep, *Pliny* especially, and in that to plant the Sets, or Cuttings of the same Length, at six Foot distance; these, if the Sets be large, will become Trees immediately, which, after the first three Years, are to be cut within two Foot of the Ground; then he tells us, that we must dig about them in *April*. Some raise abundance of them, by only laying the Poles of them in Earth. In *Pliny's* Time, they made Vine Props, or *Juga*, for bending Archwise, and yoaking as it were the Branches of the Vines to one another; and one Acre has been sufficient to yield Props for a Vineyard of twenty five Acres.

The woody Sorts of Willows delight in Meadows and Ditch Sides, rather dry than over wet; yet the black and reddish Sorts will bear to grow in Grounds indifferently moist, and may be planted of Stakes as big as one's Leg, and set in the Earth the Length of five or six Foot, the Hole made with an Oaken Stake, and Beetle, so that the Set may not be forced in with too great Violence; but first
it

it is necessary to stop the Trunchions at both Extremes, and the thickest End planted downwards. We may let these Sets lie in Water two or three Days before we plant them. This should be done in *February*, and the Earth closed about them as well as possible.

If we plant these as a Wood, or Coppice, plant them at six Foot distance, in the *Quincunx* Order, and be careful to cut away all Suckers from them at the End of three Years.

The Shoots of these of four Years growth, will yield good Sets, to be planted about the same Distance as before. A Willow Coppice thus ordered, may continue about five and twenty Years in good Order, and after this being replanted with fresh Sets, will again renew the Profit we may receive from this Sort of Plant, which will be very considerable.

If your Ground be fit for whole Coppices of this Tree, fling it into double Ditches, making every Ditch three Foot wide, and two Foot and half deep, and between the Ditches leave four Foot of the Ground; plant the Sets in this about five or six Foot asunder; these, in three Years, will be fit to lop, which should be done within a Foot of the Ground, and will then make good Heads, that will turn to good Profit.

We have yet one or two more Sorts of Willow, the first is the Garden Willow, which produces a sweet and beautiful Flower, fit to be admitted among the Curiosities of the Garden; and there is also another Sort in *Shropshire*, which is very sweet, and very fit to be planted by the Sides of Rivers, both for Ornament and Profit; it is propagated by Cuttings, or Layers, and will grow in any dry Bottom, if it be shelter'd from the South and extreme Heat of the Sun; this affords an early Help to Bees; and indeed we may say, with good Reason, of these *Aquatick* Trees, that nothing brings a

furor Crop, nothing requires less Care, or is safer from the Injuries of the Weather; and in short, there is no more to do after it is planted than to defend it from the Browse of the Cattle; for, as *Virgil* says,

*Texenda sepes etiam, Et pecus crine tenendum est:
Præcipue dum frons tenera imprudensque laborum:
Cui, super indignas byemes Solemque potentem,
Sylvestres uri Assidue capreæque sequaces
Illudunt: pascuntur oves, avidæque juvencæ.
Frigora nec tantum canâ concreta pruina,
Aut gravis incumbens scopulis arentibus æstas;
Quantum illi nocuere greges, durique venenum
Dentis, Et admorso signata in stirpe cicatrix.*

Which is English'd thus, by a late Commentator upon *Virgil*.

*Next weave a stubborn woody Fence around;
And keep pernicious Cattle from the Ground:
Chiefly when tender Shoots at first appear,
Hardships and Toil as yet unfit to bear:
In parching Summer, and in Winter Snows,
Wild Beasts, and wanton Goats insult the Boughs,
And Sheep, and hungry Heifers, feed the luscious
Browse,
Not hoary Frosts, not all the dint of Cold,
That hardens into Store the yielding Mold;
Not raging Heats, that pierce thro' thirsty Rocks,
Make such destructive Harack as these Flocks,
With such invenom'd Teeth, they scar the sappy
Stocks.*



C H A P. XVIII.

A View of the Husbandry in Virgil's first Georgic.

THE *Georgics* take their Name from the Greek γεω γίς, *Agricola*, Agriculture; or from γαῖα or γῆα, Earth, and ἔργον, Labour; this Work of giving Precepts to the Husbandmen, for the Labour of the Earth, *Virgil* has given us in four Books, which he undertook to write, at the Request of *Mæcenas*, a Minister of the first Rank, and a true Rewarder of Merit, who, at the same Time he gave *Virgil* his Commission, allowed him such a Competency as was convenient and necessary to keep his Poet's Mind easy and undisturb'd, the surest Way of bringing forth a compleat Piece. The first *Georgic*, which relates to Soils, Seasons, and that Branch of Husbandry which tends to the Production of Corn, Pulse, and such like, is what I shall consider in this Chapter, that we may judge how much the Husbandry of *Virgil* is agreeable to what I have related from *Columella*, *Varro*, *Pliny*, *Cato*, *Palladius*, and others.

Our Poet begins to enter upon Business.

*Vere novo, gelidus canis cum montibus humor
Liquitur & Zephyro putris se gleba resolvit;
Depresso incipiat jam tum mihi taurus aratro
Ingemere, & sulco attritus splendescere vomer.*

Which Mr. Dryden renders thus:

*While yet the Spring is young, while Earth unbinds
 Her frozen Bosom to the Western Winds;
 While Mountain Snows dissolve against the Sun,
 And Streams, yet new, from Precipices run;
 Even in this early dawning of the Year,
 Produce the Plough, and Toke the sturdy Steer,
 And goad him 'till he Groans beneath his Toil,
 'Till the bright Share is bury'd in the Soil.*

The Poet here begins his Instructions for Tillage, from the Time which is the most proper for it, the Spring, which Season was most agreeable to the Practice of the Ancients, and may be gather'd from the Authorities of *Hesiod*, and *Xenophon*, the latter of whom gives the Reason in his *OEconomicks*, why Winter and Summer are not so proper for that Work: In the first, the Earth is too Moist and Miery, and in the second too dry and Brittle. The Ground broken up at this Time of the Year, the Ancient *Latins* call'd *Verveſtum quaſi vere Aſtum*: Yet was not this Spring ploughing ſo generally obſerv'd, but that in ſome Places they began to plough about the End of *Autumn*, or Beginning of Winter, towards the ſetting of the *Pleiades*; which diverſity, very likely might proceed from the Difference of the Climate, and the Nature of the Soil; for *Pliny* tells us, that in warmer Regions, it is beſt to break the Ground in Winter, eſpecially if the Soil be ſtiff and heavy; but in colder Climates, it is beſt to do it about the *Vernal Equinox*.

The Ploughing with Oxen was common among the ancient Huſbandmen, both among the *Greeks* and *Romans*, and is at this Day alſo the common Practice of the *Engliſh* Huſbandmen in the *West* and *North Parts* in *England*, where they are more frequently uſed for drawing of Carriages, and in other Works of Huſbandry, than Horses.

In the next Place our Poet commends the fallowing of Land for bringing of rich Crops.

*Illa seges demum vctis respondet avari
Agricolæ, bis quæ solem, bis frigora sensit :
Illius immensa ruperunt horrea messes.*

Such Land he observes (as appears in the foregoing Verses) is the most Fruitful, which has been four Times plough'd, that is, first in the Winter, the next in the Spring, the third in Summer, and lastly in Winter. Again, this (*Pliny* tells) us is what *Virgil* means, when he commends such Grounds as had twice felt the Sun, and twice the Cold; which is to be understood of the Spring and Summer Sun, and the Cold of two Winters; and this likewise is the Custom in many Parts of *England*, when we fallow Land to the utmost; for besides the Benefit such Land receives from the Riches it imbibes from the Air, by being frequently exposed and turned up, it receives considerable Advantage by being often plough'd, in having its Clods broken, and its Parts rendred free and open, which is of service for the good Growth of any Plant: But then we are caution'd first, before we Plough, to observe the Seasons and the Winds.

*At prius ignotum ferro quàm scindim æquor,
Ventos & varium cæli prædiscere Morem, &c.*

This is given as a very necessary Caution by *Xenophon*, *Pliny*, and *Columella*, that when when we set about the Work, we may not be interrupted by ill Wheather; and then to consider what kind of Seed, or Grain, the Soil will best agree with, which is all in all, both in Husbandry and Gardening, for there can be no Profit of our sowing,
if

if the Plant is not agreeable to the Soil it is planted in, 'tis working against the Stream.

Our Poet in the next Place comes to direct the different Times of ploughing rich and poor Grounds.

————— *Ergo age, terræ*
Pingue solum primis extemplo à mensibus anni,
Fortes inventant tauri: glebasque jacentes
Pulverulenta coquat maturis solibus æstas.
At si non fuerit tellus fœcunda, sub ipsum
Arcturum tenui sat erit suspendere sulco:
Illic officiant latis ne frugibus herbæ;
Hic, sterilem exiguus ne deserat humor arenam.

In the Spring he directs us to plough our fatter and richer Soils, that they may be benefited by Summers Sun; and the poorer Land about the rising of *Arcturus*, which is in the Nones of September; but herein *Virgil* differs from *Theophrastus*, who prescribes the ploughing of wet and close heavy Grounds in Summer, and light, loose and lean Soil in Winter. In this poor Soil, says *Virgil*, we must not suffer the Plough to go deep, least our Corn should be overrun with Weeds. But I have already explain'd this, in my Notes upon a former Chapter. Our Poet goes on:

Alternis idem tonsas cessare novales
Et segnem patiere situ durescere campum.

Here we are advised to let our poorer and worn-out Grounds be sown every other Year, and to be fallow'd between whiles, for the recovery of its Strength. Of the resting of Ground, *Xenophon*, in his *Œconomicks*, agrees with *Virgil* in this, and seems to have borrow'd it from *Pindar*, *Nem. od. ult.*

Virgil now having taught us the peculiar Times for ploughing, according to the Natures of the
several

several Soils; he proceeds to give Instructions for the meliorating of Ground, which he advises by change of Seed, Stercoration, and several kinds of Compost; the Reason for the First, is, in regard the Earth, by receiving only one kind of Grain, comes to a Satiety, and Fructifies but poorly: Wherefore, besides the resting of the Ground, it is requisite to vary the Seed, as Lord Bacon tells us, in his Natural History.

Of this Change of Seeds, *Virgil's* Words are:

*Aut ibi flava seres mutato sidere farra;
Unde prius latum siliqua quassante legumen
Aut tenues fœtus vicia, tristisque lupini
Sustulereis fragiles calamos, sylvamque sonantem.*

And is thus translated by Mr. Dryden:

—where Vetches, Pulse, and Tares have stood,
And Stalks of Lupines grew (a stubborn Wood)
Th' ensuing Season, in return may bear,
The bearded Product of the Golden Year.

And then our Poet goes on to tell us, the Damage which Flax and Oats, and Poppies, do the Ground, by burning and consuming its Moisture. The Reason for the first, *Columella* makes to be the Quality of the Plant, which, he says, is of a hot Nature. The second, *Theophrastus* assigns to the Number of its Roots, which much exsiccate and impoverish the Earth. The third, which is the Poppy, is by *Diagoras*, and *Erasistratus*, in *Pliny*, not only condemn'd for a soporiferous but a deadly Quality, proceeding not from Cold, as was anciently believed, but as the Chymists, and Naturalists, have lately experienced, from a Narcotick Sulphur, and bitter Salt inherent; which is also found in hot Things, as in Spirit of Wine, &c.

In the next Place *Virgil* teaches us to manure our poor Grounds with Dung, and with Ashes, which will be beneficial, notwithstanding this changing of Seeds, and fallowing of Ground.

*Sed tamen alternis facilis labor : arida tantum
Ne saturare fimo pingui pudeat sola ; neve
Effætos cinerem immundum jactare per agros.*

Mr. *Dryden* gives us a good Translation of this:

*But sweet Vicissitudes of Rest and Toil
Make eisy Labour, and renew the Soil.
Yet sprinkle sordid Ashes all around,
And load with fatt'ning Dung thy fallow Ground.*

Here, after the resting of the Soil by change of Seed, which is a notable Piece of Husbandry, he comes to the use of Dungs, which is the most ordinary Way of meliorating Lands. We find, by *Columella* and *Varro*, that Sheeps Dung was accounted the best, or Pidgeons Dung, and that of Kine; and after that the Dung of Horses, which is held to be somewhat too hot, unless it is well rotted or mellow'd, or mix'd with something else of a colder Nature. The ordering of Dung is, if the Ground be Arable, to spread it immediately before ploughing, or sowing, and so plough it in, for if you spread it long before, the Sun will drive out much of the Fatness of the Dung: But if it is Grazing Ground, then spread it somewhat late, before Winter, that the Sun may have the less Power to dry it up. It is generally receiv'd of Old, that dunging of Lands, when the *West* Wind blows, and in the Decrease of the Moon, is of great Service to the Land; the Earth then, it seems, being more thirsty, and open to receive the Dung, as my Lord *Bacon* tells us.

Among

Among those Substances which have a Virtue of fertilizing of Ground, though they be not merely Earth, Ashes excel, inſomuch that the Countries about *Ætna* and *Veſuvius*, have ſome Amends made them for the Miſchief done ſometimes by their Irruptions, by the extraordinary Fruitfulneſs of the Soil, cauſed by the Aſhes ſcattered about; but it is not ſuch Aſhes only, but any Aſhes are enriching to Ground, whether they be Aſhes of burnt Earths, or of Vegetables.

In varying of Seeds, the Ancients obſerved this Method, in fat Grounds, after a Crop of Wheat, Rye or Barley, to ſow them twice with Pulſe, and the third Year with Corn again.

In indifferent Soils, after a Crop of Corn, to ſow them thrice with Pulſe; and in poorer Grounds, to lay them Fallow.

He next goes on to ſhew the Benefit of burning of Lands.

Sæpe etiam ſteriles incendere profuit agros, &c.

But this I have already explain'd at large, in my Notes upon one of the foregoing Chapters. Our Author then goes on:

*Multum adeo, raſtris glebas qui frangit inertes,
Vimineasque trahit crates, juvat arva; neque illum
Flava Ceres alto nequicquam ſpectat Olympo:
Et qui, proſciſſo quæ ſuſcitât æquore terga,
Ruſſus in obliquum verſo perrumpit aratro:
Excercetque frequens tellurem, atque imperat arvis.*

Mr. Ogleby tranſlates it thus: And nearer the Purpose than Mr. Dryden.

*Much more Advantage to the Swain it yields
To uſe the Rake, than harrow ſterril Fields;*

Nor

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Nor golden Ceres, from the lofty Skies
 Shall view his Labour with regardless Eyes.
 And who, athwart the Furrows plough's the Plain,
 Then breaks the Clods obliquely o'er again;
 Turning his Team, and by a frequent Toil,
 T'Obedience brings a Disobedient Soil.

This breaking of the Clods is of great Service to Land, for rendring of it Fruitful, which the Rake will do more effectually than the Harrow, and cross ploughing often repeated, will undoubtedly reduce the more stubborn Clods to small Parts; this oblique Ploughing the *Latins* call'd generally *Iterationem*: But *Servius* has mistaken the Time when it was to be done; he telling us, it should be perform'd in the *Autumn*; for *Varro* says, it was perform'd in the Summer; *Inter solstitium & Caniculam*; Occasion and Iteration were Works which both tended to the same End, tho' the one was done with the Harrow, and the other with the Plough, yet their Design was to break and lessen the Clods of the first ploughing, so as to render the Earth as fine as possible.

In the next Place, *Virgil* comes to speak of the sowing Season, and of the putting the Seed into the Ground, and its Treatment afterwards.

*Humida solstitia atque hyemes orate senenas
 Agricola: hyberno latissima pulvere farra,
 Latus ager: nullo tantum se Mysia cultu
 Faciat, & ipsa suas mirantur Gargara messes.
 Quid dicam, jacto qui semine cominus arva
 Insequitur, cumulosque ruit male pinguis arena?
 Deinde satis fluvium inducit, rivosque sequentes?
 Et cum exustus ager morientibus aestuat herbis,
 Ecce, supercilio clivosi tramitis undam
 Elicit: illa cadens raucum per levia murmur
 Saxa ciet, scatebrisque arentia temperat arva.*

Which

Which Mr. Dryden gives us thus in English:

*Ye Swains, invoke the Pow'rs who rule the Sky,
For a moist Summer, and a Winter dry:
For Winter Drought rewards the Peasant's Pain,
And broods Indulgent on the bury'd Grain.
Hence Mysia boasts her Harvests, and the Tops
Of Gargarus admire the happy Crops.
When first the Soil receives the fruitful Seed,
Make no delay, but cover it with Speed:
So fenc'd from Cold; the plyant Furrows break
Before the surly Clod resists the Rake.
And call the Floods from high, to rush amain
With pregnant Streams, to swell the teeming Grain.
Then when the fiery Suns too fiercely play,
And shrivell'd Ears on withering Stems decay,
The wary Farmer on the Mountains brow
Undams his watry Stores, huge Torrents flow;
and ratling down the Rocks, large Moisture yield,
Temp'ring the thirsty Fever of the Field.*

These Lines shew us the Seasons most proper for sowing; or rather, what Years will be the best for the Welfare of Corn. This saying, of moist Summers, and dry Winters, which should be the Farmer's Wish, relates chiefly to stiff Soils, which we find our Poet recommends for Corn; for if the Winter be over Moist, in such Grounds the Corn turns yellow, by the standing of the Water, and grows Weak; and if the Summer be dry, in such Soil, the Ground binds too hard, and restrains its Nourishment; but if the Summer be wet, the Quality of the Air then is such, that no Water can lie long in such Ground, and the Ear will be fill'd to the Advantage of the Farmer; and besides, this Wish is so general, that it affects the Sands, or light Lands likewise; for there is no Winter that can be so dry, but that the lightest Land will be held together, and preserve Moisture enough

enough for the Support of Corn; and a wet Summer must certainly assist such Ground, by keeping it continually impregnated with Moisture. I have this Summer made an Experiment relating to the Nourishment of Vegetables, which, in this Place may not be improper to insert; it relates in particular to the Share of Nourishment Plants receive from Water, and from the Earth: I gather'd several Flowers and Fruits upon Branches, which I set in plain Water for five or six Days; some of them, which delighted chiefly in dry Soils, in three Days Time had entirely lost their Verdure, and, I may say, all Shew of Life; but those which were of such Kinds, as required moist Lands to grow in, were in good State at the End of the Week, only the Flowers they open'd while they were in the simple Water, were paler by Degrees, 'till they had almost lost their original Colour, which shew'd how much the principles of Colour in those Plants depended upon the Earth rather than the Water, for the Paleness of the Flowers denoted a Weakness in the Plant. Among these I had some Plants which are naturally Natives and Inhabitants of Swamps, or Boggs, among which was a Branch of the Passion Tree, with Fruit and Flower Buds, these outliv'd all the rest, and had no other seeming Want than of some Body a little stronger than Water to support them; they grew and repeated their Blossoming; but the Shoots, which advanced near five Inches in Length during this Time, were somewhat weak, but yet had a shew of Health; and the Fruit of the Passion Tree remain'd as it was at first, unless that it rather appear'd duller in its Colour than at the first, these gave me some Notion of assisting my Spriggs with something more than Water, and prepar'd some Bottles of Sand and Water, in which I put such a Quantity of Sand, as to reach pretty near the Top, in these
I set

I set my Plants, or Sprigs, which were still alive in the common Water, putting into each Bottle a small Quantity of Nitre, and in four and twenty Hours the Fruit of my Passion Tree was sensibly bigger, and fill'd so much, that its Rind, or Covering, recover'd its former Verdure, and began to shine, as it will do in its greatest Prosperity upon the Tree itself, so that there is now the greatest likelihood of its coming to Perfection. I should intimate however, that some of the Plants which had lost the Colour of their Blossoms, while they were maintain'd by simple Water, being put deep enough in the Bottles to be cover'd about two Inches with the Sand, have recover'd their Strength, enough to show their Blossoms almost of their primitive Colour; and even those which do not touch the Sand, receive so much Benefit from it, that they have regain'd their Strength of Colour in their Flowers, as much as the others. This will shew us, how much Water is necessary for the Support of Plants; and also, how necessary Earth is likewise for their Nourishment. And I must add likewise, that when my Windows of the Room where they stood, were shut in the Night, I found, that my Sprigs were feeble to the Touch the next Morning, and wanted that Springiness which is common in the Leaves of healthful Plants; but in an Hour after the Windows were open'd, that they had a free Communication with the Air, they recover'd their Strength so much, that one could discern no Difference between them and growing Plants. But there is this to be observed, that the Chamber where these Plants were kept, open'd to a River three several Ways, so that the *Effluvia* rising from the Water might have some Effect upon their spongy Parts, as a Sponge will fill itself when the Air about it is moist, and so become more weighty: So we may see how necessary it is that Plants should enjoy a freedom

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in these three Elements, besides what Advantage the Sun is of to Plants. Here it is plain, that Plants are not all equally design'd to draw Nourishment from Water; nor by common Experience do we find, that Plants will prosper with Earth alone, nor with both these without Air; but every Element must be free to them, and not imposed upon them, so that in the stiff Soils, where Water lies stagnant among Corn, it spoils the Corn, by making it turn yellow, and the too great Want of it likewise is as injurious.

It is also observable, the Harmony that there is between these Elements, a Plant cannot subsist without the Concurrence of all these, and it is the same with Fish too; for in the Trials I made about four Years ago, of hatching the Spawn of Fish in Earthen Pans, my Fish would live very well in those Pans which had Earth at the Bottom of the Water; but I could not keep them alive, in those Pans where I had no Earth to support the Water; and in some young Fish, which I caught when they were small, and put into my Pans, I found that those of the same hatching in the River from whence I took them, were, in *Autumn*, as big again as those I had kept in my Pans; which I suppose was, because those of the River had more Nourishment from the Body of Earth and Water they enjoy'd, than mine had in the Pans: Though I gave them fresh Water from the same River, every other Day, yet were they not near so big, but were like Plants educated in Pots, in Proportion to those that have the whole Body of Earth to feed from. But this Remark runs a little too far for my present Purpose, I must return to my Subject, the ancient Proverb, to wish for a dry Winter, and a moist Summer: This, as *Macrobius* says, *Virgil* seems to have taken from the most primitive Prescripts of *Italian Husbandry*, express'd in these Verses.

*Hiberno pulvere, verno luto,
Grandia farra, Camille metes.*

That is,

*Winter Dust, and Summer Rain,
Bring Camillus Store of Grain.*

But of this Season, *Pliny* says, that many anticipate the Time of sowing, and begin after the Eleventh of the *Autumnal Equinox*, the Constellation *Corona* then rising, when, for certain Days, there is a constant fall of Rain. It was a certain Rule, not to sow before the Rains began to fall; so that the fittest Time for it was, at the setting of the *Pleiades*; which, among the Ancients, was the most legitimate Season; as from the Testimonies of *Hesiod*, *Xenophon*, *Theophrastus* and *Pliny*. But *Pliny* seems to contradict our Author, concerning the Advantage of a dry Winter for Corn, when he tells us, that both Corn and Plants affect long Snows. However, it is observed by some of the Ancients, that Dust helps the Fruitfulness of Trees, and Vines especially, insomuch, that they cast Dust upon them on Purpose: And they note, that those Countries where the Fields and Ways were most dusty, brought the best Grapes. But this Excellence of the Grape, in such dusty Places, must not be understood to proceed from the Dust which settled among the Leaves and Fruit, but, as it intimates, a light sandy Soil, which will produce more Dust than any other Soil; for Experience shews us, that such light Soils are the best for Grapes.

In the next Place, what *Virgil* says, concerning the covering the Seed as soon as 'tis sown, is certainly very proper, that the fresh Moisture of the Earth may be clos'd to it; and also, the raking
X 2 the

the Ground, while the Clods are fresh and tender, will contribute to make the Ground fine.

Gargarus, is, by some, taken for the Top of Mount *Ida*, after *Servius*. But *Macrobius*, lib. 5. cap. 20. supposes it, with a good deal of Reason, to be a City at the Foot of *Ida*, celebrated for the fertility of its Soil, occasion'd by the descent of Rain from the Mountains, kindly overflowing the Level, which brings with it an enriching Slime and Compost.

Deinde satis fluvium inducit, &c.

This Method of watering of Corn Grounds, mentioned by *Virgil* in these Lines, is not commonly practised in *England*; though, in my Opinion, were it done discretely, it would turn to very good Profit in some Lands; for in many Cases, the Irrigation of Lands is better than any Manure. It is done two Ways, the one, by letting in, and shutting out of Waters, at seasonable Times; this Way serves only for Meadows which are near Rivers.

The other Way is to bring Waters from some hanging Grounds where there are Springs, into the lower Grounds, carrying it in long Gutters, and from those Furrows drawing it traverse to spread the Water; this Water is the richer if it comes from fruitful Grounds, because it washes some of the Fatness of those Grounds as it passes through them; and commonly, where there are great Overflowings in the Fens, the drawing them in the Winter, makes the following Summer more Fruitful. The Reason may be, as Lord *Bacon* observes, because it keeps the Ground warm, and nourishes it; and in the Summer, it cools and refreshes it.

Virgil goes on:

Quid

*Quid, qui, ne gravidis procumbat culmus aristis,
Luxuriam segetum tenera depascit in herba,
Cum primum sulcos æquant sata? ———*

That is, in Mr. Dryden's Version,

*And lest the Stem, too feeble for the Freight,
Should scarce sustain the Head's unwieldy Weight;
Sends in his feeding Flocks, betimes t'invade,
The rising Bulk of the luxuriant Blade,
E'er yet th' aspiring Offspring of the Grain
O'ertops the Ridges of the furrow'd Plain.*

But this watering commonly, makes the Corn shoot with too much Luxuriance; or grow Rank, as the Farmers Term it; and therefore, in such a Case, they cannot hope for a tolerable Crop, unless they cheque its over Vigour; which they commonly do, by feeding it with Sheep; but then it must be done before it begins to stalk, for then to feed it would destroy it; but while it is in the Grass, or Blade, the cropping of its Top makes its Root spread, and put out many Stalks which will not bring their Ears overcharged with Grain, so as to lodge upon the Ground, which the Corn, in its first growth would be apt to do, and is the meaning of *Virgil*. *Pliny* also tells us, that about *Babylon*, they used to mow their Corn twice, and then to turn in their Sheep. And *Columella* mentions the cutting of green Corn for Fodder, and feeding it, after which it stands for a Crop; as may be observ'd in the former Part of this Work.

The next material Observation of *Virgil*, is:

Nec tamen (hæc cum sint hominumque, boumque La-
bore

*Versando terram experti) nihil improbus anser,
Strymonique grues, & amaris intuba fibris,
Officiunt, aut Umbra nocet. ———*

That is,

*Nor yet the Ploughman, nor the lab'ring Steer,
With all their Toil, can make a fruitful Year,
If glutton Geese, and the strymonian Crane,
With foreign Troops invade the tender Grain;
And tow'ring Weeds malignant Shadows yield,
And spreading Succ'ry choaks the rising Field.*

Virgil here directs the Farmer to beware of four great Enemies to Corn, Geese, Cranes, Succory, and Shade; the first are very destructive to all young Buds and Shoots, for they crop every thing they can come at, that is green and tender; and then their Dung is very injurious to Herbs, as *Columnella*, *Varro*, and *Paladius* observes: And besides, their broad web'd Feet do a great deal of Mischief to Corn, flattening it down in a wet Season.

Secondly, the Crane is taken notice of for the Damage it does to Corn; but I suppose, for no other Particular than what is observable in other Fowls, unless the Dung of the Crane is as injurious to Ground as that of the Goose, or, as *Columnella* mentions, of all Water Fowls, and the Crane may well be reckon'd one of them, from its constant frequenting watry Places, and its Food, which is the same with that of the other amphibious Fowls.

Thirdly, the *Intubus*, or Endive, is said to be hurtful two Ways, as *Turnebus* observes, first, by the spreading of its Roots, which drain the Juice of the Earth, and rob the Corn; and in the next Place, as it is a great inviter of Geese, who affect this Herb extremely.

Fourthly, Shade is hurtful to Corn, whether it be occasion'd by Trees which drip upon the Corn, the same Time they keep the Sun from it, or by any other Means, which prevents the Heat of the Sun from coming at the Corn; where it happens

pens to be the first, there we always find the Corn, or Grass, run up with small Spindles, and unprofitable Ears, because the Roots of the Trees impoverish the Ground, and the Boughs keep the Rains from penetrating as they should do, to revive the Earth; and the Drip too, if it is from a Tree, or Plant with bitter Juices, will also Poison the Ground, so that nothing can grow under some kinds of Trees for that Reason. The Walnut, Firr, Pine, and Juniper, *Pliny* reckons to produce deadly Consequences to Plants that grow under them; but yet they are not so malign, but that some Plants will outbrave their evil Dispositions, though but few; therefore *Pliny* is much in the right, when he says, that it is of Consequence for a Farmer to know what Plants receive either Nourishment or Detriment by Shade, some Plants thriving more in the Shade than Sun, as Strawberries, and Bays, and Ivy, &c.

But if our Corn happens only to be debarr'd from the Sun by the Situation of some Hill, or Mountain, or some other Body, without having the Ground impoverish'd by the Roots of Trees, or Plants, or unwholsome Drips, yet this Corn cannot produce such large Ears, or so full Grain, as that which has the Benefit of the Sun to digest, or ripen the Juices in the Plant, which must be done before the Plant can bear Fruit; but in such shady Places we shall have our Corn grow very rank, and strong in its Straw, which is always observable in every Plant that grows in the Shade: But then, as I have often said, such Luxuriance is always an Enemy to fruitfulness; but the Sun takes off the too abundant watery Juices, and digests the rest for bringing of Fruit.

But these Evils are not yet all which the Farmer is to arm against, says *Virgil*,

*Mox & frumentis labor Additus: ut mala Culmos
Esset robigo, segnisque horreret in arvis*

Carduus: intereunt segetes, subit aspera sylva,

Lappaque, tribulique: interque nitentia culta

Infelix lolium & steriles dominantur avena.

Quod nisi & assiduus terram insectabere rastris, &c.

That is, as Mr. Dryden gives it us:

*Soon was his Labour doubl'd to the Swain,
And blasting Mildew's blackned all his Grain;
Tough Thistles choak'd the Fields, and kill'd the Corn,
And an untbristy Crop of Weeds was born;
Then Burrs and Brambles, an unbidden Crew
Of graceless Guests, th' unhappy Field subdue:
And Oats unblest, and Darnel domineers,
And shoots its Head above the shining Ears;
So that, unless the Land with daily Care
Is exercis'd, and with an Iron War
Of Rakes and Harrows, the proud Foes expell'd, &c.*

We find here a fresh Scene of Mischief, from the Mildew in the first Place, which is here call'd Robigo, and by some Rubigo, is the Smut in Corn, which often spoils whole Fields, or Crops, of Grain; for where this happens in any Quantity to distinguish itself, it spoils the whole Parcel of Corn for Sale, and renders it unwholsome to be used in Flower or Meal; or to be sown, we must certainly expect our Crop to produce a great deal of it. Scaliger, on Theophrastus, tells us, that Smut, or Mildew, is a certain Putrefaction, when the Dew, or Rain, that is lodg'd in the Ears of Corn, is not shaken off, but by the adventitious Heat of the Sun corrupts and putrefies. It is supposed, that this Disease happens most in enclosed Grounds, where the Air is more close than in Hills or Champain. The Remedy of this, says Pliny, is by sticking Laurel Branches in

in the Ground (that is, what we call the Bay) which will draw the blasting Vapour to them; and for this End were the Feasts, call'd *Rubigalia*, instituted by *Numa*, in the Eleventh Year of his Reign. But I differ in Opinion from *Scaliger*, that this Smut in Corn is the Effect of Putrifaction: My Opinion is, that all Blights proceed from Insects, for besides the Observations I have made with Microscopes, upon the Black in Corn, which plainly discovers it to be the Eggs of Insects; there is a certain Remedy found against it, by Colonel *Plummer*, late of *Hertfordshire*, which consists in steeping of Corn before it is sown, by which these pestiferous Eggs are destroy'd; so that the Corn steep'd, as he directs, will not produce any smutty Corn. The Receipt for making this Brine, for steeping of Corn, is in my Monthly Writings.

The next Mischiefs mentioned by *Virgil* to offend the Husbandman, are Weeds, such as Thistles, Briars, Burdocks, Caltrops, Darnel, and Barren or Wild Oats. *Pliny*, I think, is much out of the Way, when he makes these, viz. the *Carduus*, *Lappa*, *Tribulus*, and *Lolium* to be Diseases of Corn, no less than the *Robus*, or Smut; for if the Seeds were not sown with the Corn, or the Seeds of these Weeds were not in the Ground before the Corn was sown, the Plants would not appear. But yet, it seems, that the Ancients were strongly possess'd of an Opinion for Equivocal Generation, and even of the *Metamorphosis* of Plants; though the Observations which have been made in our Times plainly convince us, that there is no natural Production, either in the Vegetable or Animal Kingdom, but what comes from the Egg of some Parent Plant, or Animal; so that the Weeds here mentioned by *Virgil*, are not to be suppos'd the only Kinds that will spoil Corn, but any others that would yield as much Shade, and
rob

rob the Earth as much of its Nourishment, would annoy Corn as much as these, if the Seeds of them happen'd to be sown among the Corn, or lie in the Ground before the Corn was sown. But it would have been tedious for *Virgil* to have mentioned more, he has said enough, to warn us against the evil Effect of Weeds among Corn, and has prescribed a general Remedy against all manner of Weeds, in breaking the Ground continually with Rakes, or Houghs, which our modern Practice shews us, is the best Way of destroying Weeds.

Virgil comes in the next Place to describe such Tools as are proper for the Husbandman.

*Dicendum Est quæ sint duris agrestibus arma :
 Quæ sine, nec potuere Seri, nec surgere messes.
 Vomis Est inflexi primum grave robur aratri,
 Tardaque Eleusine matris volventia plaustra,
 Tribulaque, trabeaque, Est iniquo pondere rastro :
 Virgea præterea Cælei vilisque supellex,
 Arbuteæ crates, Est mystica vannus Iacchi.*

I should have given my Reader Mr. Dryden's Version of these Lines, but that there is no manner of Agreement between the Tools he mentions, and those which are recommended by *Virgil*; so that Mr. Ogleby's Translation being more to the Purpose, it may supply the Place.

*The bardy Ploughman's Tools we next must know,
 Which wanting, we can neither Reap. nor Sow.
 A heavy Plough of crooked Oak, a Share,
 And the slow wheel'd Elusine Mothers Carr,
 Sledges, and Flails, Rakes ponderous enough ;
 Fine Oser Baskets, Country Household stuff,
 Hurdles, and last, Iaccus mystick Van.*

It appears by *Columella*, and *Paladius*, that the Ancients had more than one Sort of Plough; for,
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in the first Place, we find, that the several Directions they give us for breaking, or turning up the Ground, cannot be done with one Plough. Where they only direct us to raise the Surface not two Inches, which they tell us, must be done with the Plough; it must be of a different Sort from that which they direct us to plough deep with; and *Paladius* says, Ploughs are Single, or if the Country be Plain, there they use ear'd Ploughs, to raise the Land in high Ridges, to preserve the Corn from the Wet of the Winter. But I shall give a view of what I suppose their Ploughs were, in a Table of Instruments used in Husbandry. The *Vomis*, or *Vomer*, is undoubtedly the Ploughshare, as *Plaustrum* is a Cart, or Waggon; the *Tribula*, which is here translated a Flail, was by no means such an Instrument as the Flail of our Times, though perhaps it might be used some Way in the separating of Corn from the Stalks; I conclude from the Name *Tribula*, it should represent that Instrument used in War, call'd a *Caltrop*, set with Spikes, to keep off the Enemies Horse; as the Plant called *Tribulus* has that Name from the Burrs which it bears, resembling that Instrument, which I shall further Explain in the Table. The *Trabea*, or *Traba*, was a Vehicle without Wheels, properly a Sled; and the *Rastrum* was undoubtedly a Rake, or Harrow, i. e. an Instrument set with Iron, or Wooden Teeth, to break the Clods of the Earth finer than the Plough will do; so likewise was the *Occa*, either a Rake, or Harrow, or Hacker, from whence *Occatio*, which is the Work of breaking the greater Glebes of Earth into smaller Pieces. The *Virgea supellex*, which Mr. Ogleby translates Osier Baskets, seems proper enough, though it means likewise any Sort of Household Stuff made of Wicker. The *Arbutæ Crates*, says the Commentator upon *Virgil*, in the *Delphin* Edition, are Hurdles made with the

the Shoots of the Tree call'd *Arbutus*, which we find are very tough, and easy to bend, and was certainly the Meaning of *Virgil*, who uses *Arbuta*, as well as *Arbutus*, *Ecl.* 3. l. 82. for the Strawberry Tree, which was also admir'd by the Ancients for its agreeable Shade, as *Horace*,

Nunc vicidi membra sub arbuto stratus.

This, concerning the *Arbutus*, I the rather take Notice of, because when I shall by and by, speak of the Graffings of the Ancients, it will be a Note of further Use than to shew that the Ancients made Hurdles of it. The next is the Van, or Fan, for winding of Corn, as the Farmers express it, which separates the Grain from the Chaff, concerning which there can be no dispute;

Vannus, i. e. cribrum, vell ventilabrum frumentarium

When *Virgil* has given us an Account of the Instruments used in Husbandry, he proceeds to the preparing the *Aria*, or, as we term it, the Thrashing Floor,

*Area cum primis ingenti aquanda cylindro,
Et vertenda Manu, Et creta solidanda tenaci:
Ne subeant herbae, neu pulvere victa fatiscat:
Tum variae illudunt pestes.*

By *Mr. Dryden* thus:

*Delve of convenient Depth, your thrashing Floor;
With temper'd Clay, then fill and face it o'er:
And let the weighty Roller run the Round,
To smooth th' unequal Surface of the Ground;
Left crack'd with Summer Heats, the flooring flies
Or sinks, and thro' the Crannies Weeds arise.
For sundry Foes the rural Realm surround, &c.*

Mr.

Mr. *Dryden* is pretty near the Sense of *Virgil* in this Translation, but mistakes in making *Creta* to signify Clay in this Place, though sometimes it has been so understood; but here, *Virgil* certainly means Chalk, which will bind, without being subject to crack by the Summers Heat, or to breed Weeds, both which Clay is subject to: But be this as it will, *Cato*, and *Columella*, have still given us an Improvement upon what *Virgil* has directed; *Cato* says, let the Earth of the Surface be a little stir'd, and then spread well over with Lees of Oyl, to mellow and strengthen it, and when it is well soak'd and broken, it must be levell'd with a Roller, or Beater, and being then well smooth'd and plain'd, it will not be molested with Ants, and becomes so solid, that when it Rains it will not be miery. *Columella* tells us, that after the Surface is dug and levell'd, we must strew it over with Chaff, and Lees of Oyl, then with a Rammer, or a Stone, must be beaten, or press'd, 'till it be close and well settled, and then again strewing some Chaff over it, we may leave it to be dry'd by the Sun, and it will become very firm and hard, so that no Vermin, either Ants or Mice, &c. will harm it. This Floor, says *Varro*, should be placed upon some Eminence, and should lie round, and rising in the Middle, that when it Rains, the wet may quickly run off. But this shap'd Floor is by no means convenient for Thrashing with the Flail that is now in Use; though it might be the best for Thrashing after the Manner of the Ancients.

The next Thing we have to consider is, what *Virgil* observes concerning the *Prognosticks* of a Plentiful Year, or of the contrary.

*Contemplator item, cum se rux plurima sylvis
Induct in florem & ramos curvabit olentes:*

*Si superant fœtus, pariter frumenta sequentur
 Magnaque cum magno veniet tritura calore.
 At si luxuriâ foliorum exuberat umbra
 Nequicquam pingues paleâ teret area culmos.*

Which Mr. Dryden gives us thus in *English* :

*Mark well the flow'ring Almonds of the Wood,
 If od'rous Blooms the bearing Branches load,
 The Glebe will Answer to the Sylvan Reign,
 Great Heats will follow, and large Crops of Grain.
 But if a Wood of Leaves o'ersbade the Tree,
 Such, and so Barren, will thy Harvest be :
 In vain the Hind shall vex the thrashing Floor,
 For empty Chaff and Straw will be thy Store.*

The Commentator upon *Virgil*, in *Usum Delph.* agrees with Mr. Dryden, that *Nux* is, in this Place, taken for the Almond, which, by the Abundance of its Flowers, indicates a full and fruitful Year; *Nucis*, says he, *varia sunt species: amygdalam hic inteligunt rei rustica scriptores, cujus flores fertilitatis indicium esse statuunt.* But I cannot help dissenting from both their Opinions; for, in the first Place, the Almond never was a Plant of the Wood in *Italy*, where *Virgil* Writ this Piece; for it is easy to prove, from all the Roman Writers of Plants, as well as the Writers of Plants in the Time of the Romans, that it was brought, among other rare Fruits, to *Italy*, from *Greece*; and *Columella*, and the other *Scriptores de re rustica*, gives us very particular Rules for its Culture, which they would not have done, if it had been a Plant of the Woods, or growing Wild. Then Mr. Dryden makes the Flowers, or Blossoms of this Nut, which he calls the Almond, to be sweet scented; which Perfection is not found in any of the Almond Blossoms that I have examin'd. But

Virgil

Virgil does not say one Word of Od'rous Blooms; but tells us only, that when the Nut is loaded with Flowers, we are to expect a rich Crop, and a hot Summer. But it seems to me to be very plain, that the Nut hear meant is the Hazel, whose plentiful flow'ring at this Day is a Proverb among the Country People, that the same Year will bring a plentiful Harvest: And though I am not very apt to fall in with every old customary Saying that I hear, yet there may be some Reason for joining with the common Voice in this Case, for the Hazle puts out its Flowers, or Catkins, so as to be fully blown in *December*, or *January*, as the Season happens to be more or less favourable; and then if the Winter has been mil'd and dry, these Catkins appear always in vast Numbers, and blossom in full Perfection; otherways, if the Winter has been very wet, and has had a large Share of Frost, these Catkins, tho' they were before existing in the Tree, will not have Strength enough to open in Perfection, or at best not above a tenth Part of them, as any one may easily observe. These Trees, by a wet Winter, will sing off their Catkins while they are in the Bud, without ever opening at all. We must however observe, *en passant*, that the Catkins, when they are fully perfect, are near three Inches long, and cover'd with Dust; and what I speak of as Imperfect, and drop from the Tree, are not above an Inch long, and have no Dust at all upon them. Now when the Hazle has had the Benefit of a mild and dry Winter, it abounds in Blossoms; and, as we have observ'd before, *Virgil* recommends a dry Winter, and wet Summer for Corn; so that then, what is beneficial to the Hazle, is beneficial to Corn. But again we must take Notice, that wet Winters fill the Hazle so full of Moisture, that the two great Quantity of
Juices

Juices cast off its Flowers, and the same Cause will make it shoot luxuriant in Leaves; and the Corn being influenced, like the Hazle, by a wet Winter, must necessarily bring a luxuriant Straw and Blade, with an unfruitful Ear. But more of this may be seen in the former Part of this Work.

But I conceive there will be an Objection to what I have said, concerning the Blossoms of the Nut not being sweet scented, because, besides the Authority of Mr. Dryden, who, I believe, was a very good Poet, my Opinion is not agreeable to the Lesson given us by the Annotator, in the Delphin Edition of *Virgil*, who reads, instead of

——— *cum se nux plurima sylvis*
Induct in florem, & ramos curvabit olentes;

Cum in sylvis multa nux vestiet se floribus & demittet ramos odoriferos; which he takes from *Olentes*, because, I suppose, both him and Mr. Dryden were willing to render every thing in so good a Poem in the most noble Manner they could; and therefore made an Almond of the Hazle Nut, because an Almond is the most noble of all the Nuts, and the most noble Fruit, as well as the sweetest Flowers, must certainly make the best Figure in a Poem. But we must consider, this is a Poem upon Business, where Facts must be related as they are, or it would be of no Use; and I think, whoever Translates it as it should be, ought to have the strictest regard to the Design of the Poem, which is Husbandry; so good, that the greatest Part of what we practise at this Day in *England* is agreeable to it; began, perhaps, when the *Romans* were among us; and it may be, kept up by Particulars, who were Judges of these *Georgics*. But yet, there are many Things in this Work which are not understood, and so have been laid aside as useless,
 or

or against Reason. For my Part, I would contribute as much as lay in my Power, in that Part that immediately related to Husbandry; but for any thing else, it is beyond my Pretensions.

This Word *Olentes*, I make no doubt, every one will allow, comes from *Oleo, ere*, which is understood three several Ways; first *Odorem Emittere*, to cast forth an Odour, taken from *ὀσέω*, or *ὀσώω*. Secondly, *Crescere*, to grow to increase, *ab alo: ere unde Olo: ere, hinc Olesco & Composita, hinc Olea dicta*. And the third, which is wide from our Purpose, *Perdere*, to lose, *ab ὀλέω unde aboles ἀπολέω*. But the second Signification is the most Reasonable to stand in this Place, because there is not any Sort of Nut that grows in Europe, which has Blossoms that are sweet scented; so that *ramos curvabit olentes* means no more than the bowing of the Branches by the Weight of the Blossoms.

From all which we may gather, that when the Hazel has a promising prospect of Fertility, we may have the same Hopes of our Corn, because they both depend upon the same Temper of Seasons; or when the Hazle runs wild in Leaves, and is unfruitful, we may expect a luxuriant Blade, and an empty Ear. This is a Prognostick, confirm'd by the Testimonies of *Isidore*, in *Natural Probl. cap. 17.* and *Philo*, in the *Life of Moses, lib. 2.* My Lord *Bacon*, in his *Natural History*, commends it as a Matter of Advantage and Profit (if it be not too Conjectural to venture upon) to discern by such Signs and Prognosticks, in the Beginning of the Year, what Corn, Herbs or Fruits, are like to be Plenty, or Scarcity; so that those that are like to be in Plenty, may be bargain'd for upon the Ground; as the old Relation was of *Thales*, who, to shew how easy it was for a Philosopher to be Rich (if he would give his Mind to it) when he foresaw a great Plenty of O-

lives, made a Monopoly of them; and so, when there is a Prospect of Scarcity, one might reap Advantage by keeping the old Store; we may take this for a certain Rule, that all Fruit Trees, in a very dry hot Summer, will dispose themselves for bearing Plentifully the following Year, as we may remark by examining the Buds, which may be found upon them a little after Midsummer, for then all the Blossoms, which will open the following Spring, are existing in the Buds. The Time, which should be dry for this Purpose, is from *March* to the End of *May*; and especially a dry Winter will help the Trees for bearing.

Virgil goes on,

*Semina vidi equidem multos medicare serentes
Et nitro prius, & nigra perfundere amurca, &c.*

Which Preparation for the enriching of Seed, and what he says in the following Lines concerning the changing of Seeds, to keep our Corn from degenerating, I have already explain'd in my Notes upon one of the foregoing Chapters.

After this, *Virgil* begins to enumerate the several Constellations which should be regarded by the Husbandman.

*Præterea tam sunt Arcturi sidera nobis
Hædorumque dies servandi, & lucidus anguis;
Quam quibus in patriam ventosa per æquora vestis
Pontus & ostriferi fauces tentantur Abydi.*

Thus English'd by Mr. Dryden:

*Nor must the Ploughman less observe the Skies
When the Kids, Dragon, and Arcturus rise,
Then Sailors homeward bent, who cut their Way
Thro' Hell's stormy Streights, and Oyster breeding Sea.*
And

And so goes on to mention the several Stars which should inform us, by their rising and setting, when to sow or reap our several Crops. But as I have had Occasion already to be pretty large upon that Head, in my second Chapter of this Work, from Columella, and other of the ancient Writers of Husbandry, I shall rather refer my Reader to that Part of the Work, than repeat it; for I find it contains the same Matter which we find here mentioned by *Virgil*.

Having now learn'd how to sow and gather our Corn; *Virgil* next goes on to tell us what is to be done at Home, when the Weather is too cold for the Works of the Fields.

*Frigidus agricolam si quando continet imber :
Multa, forent quæ mox cælo properanda sereno,
Maturare datur : durum procudit arator
Vomeris obtusi dentem, cavat arbore lintres :
Aut pecori signum, aut numeros impressit acervis.
Exacunt alii vallos, furcasque bicornes,
Atque Amerina parant lente retinacula viti.
Nunc facilis rubeâ texatur fiscina virga :
Nunc torrete igni fruges, nunc frangite saxo.*

Thus in English, by Mr. Dryden :

*But when cold Weather, and continu'd Rain,
The lab'ring Farmer in his House restrain,
Let him forecast his Work with timely Care,
Which else is huddled, when the Skies are fair,
Then let him Mark his Sheep, or whet the shining
Share;
Or hollow Trees for Troughs; or number o'er
His Sacks, or Measure his increasing Store;
Or sharpen Stakes, or head the Forks, or twine
The fallow Twiggs to tie the straggling Vine;*

*Or Wicker Baskets weave, or Air the Corn,
Or ——— Grain betwixt two Marbles turn.*

The fallow Twiggs here mentioned, are of that Sort, call'd by the ancient Writers of Husbandry, *Amerines*, and bear the Name at this Day in the South Parts of France. I have treated of them at large in the foregoing Chapter.

Mr. Dryden seems to mistake the Meaning of

Nunc torrete igni fruges, nunc frangite saxo.

Which he Englishes to air the Corn, and then to grind it between two Marbles. This indeed might pass well enough, if the Romans had managed their Corn as we do now in *England*: But they had a very different Manner, as *Columella* tells us, who lived after *Virgil*, for there we learn, that what we translate the Thrashing Floor of the Ancients, was only an *Aria*, where, by means of a *Tribulus*, they divided the Corn from the Straw in a gross Manner; but did not separate the Corn from the Husk, as we may observe, by the Pains they took afterwards in steeping and parching it, before it was fit to be put into the Mortar to be beaten; and, as we are told, these several Works were sometimes repeated two or three Times over, before they could get the Grain clear of the Husk, to make it fit for Pultage; for they did not use it in Bread, as we do. But this I have treated of at large, in a foregoing Chapter, relating to the *Frummentum* and *Adoreum*; so that this Line of *Virgil's* means no more than the drying, or parching the Corn by the Fire, and then beating, or pounding it in a Mortar.

Virgil then goes on to mention those Days of the Moon which are Lucky and Unlucky, wherein he Copies from *Hesiod*, as may be seen by comparing *Ipse dies alios alio dedit ordine Luna*, &c.
with

with *Hesiod's* third Book. But it is plain enough, that the greatest Part of the *Georgic's* are taken from *Hesiod*.

But *Virgil* again enters upon Business, in the following Lines.

*Multa adeo gelidâ melius se nocte dedere :
Aut cum Sole novo terras irrorat Eous.
Noctē leves stipulæ melius, nocte arida prata
Tondentur : noctes lentus non deficit humor.
Et quidam seros hyberni ad luminis ignes
Pernigilat, ferroque faces inspicat acuto.*

Here *Virgil* advises to mow Stubble, or the driest Meadow, in the Night, or while the Dew is upon the Ground, which is what we now Practice; for when the Sun has withdrawn the Dews, we cannot make the Scythe take hold of the Grass, especially in dry Grounds. And in such cold Nights when the Husbandman cannot Work abroad, he advises him to point and sharpen Stakes, while the Wife, as he tells us in the following Verses, is to be employ'd in Weaving.

*Arguto conjux percurrit pectine telas :
Aut dulcis musti Vulcano decoquit humorem,
Et foliis undam tepidi despumat abeni.*

*Or boyls the Must of Wine, and skims
With Leaves, the Dreggs that overflow the Brims.*

This boyling of new Wine is mentioned by *Pliny*, *Lib. 14. Cap. 9.* where he says, that that Wine which we boyl 'till it loses a third Part, Part, is call'd *Sapa*; but that which is boyl'd away to half, is call'd *Defrutum*. Considering the Climate of *Italy*, this boyling of the Wine could not be done, because of the Unripeness of the Grapes, but, as I conceive, to preserve their rich

sweet Wines from fowring by the great Heats of the Summers, which is yet practised in some Places abroad, to preserve their sweet Wines.

But we must cut our Wheat, or Corn, in the middle of the Day, while the Sun is in its greatest Heat; and also take the same time of Day for thrashing it, or separating the Wheat from the Straw; for that Work is best done when the Corn is thoroughly dry, and scorched in the Sun. This is the meaning of *Virgil*, when he says,

*At rubicunda Ceres medio succiditur aestu,
Et medio tostas aestu terit area fruges.*

Thus I have gone through all the Business of the Husbandman, mentioned by *Virgil* in his first *Georgic*. I could have added his Observations concerning the Changes of Weather, which the Romans supposed might be foretold by the Flights of Birds, Croaking of Frogs, and by the Care of the Ant, in moving her Eggs into the lowest Parts of her Cell before a Storm, &c. But as long as we have the Benefit of the *Thermometer*, *Barometer*, and *Hygrometer*, which shew us, by their Variation, the Temper of the Air at any Time of the Year, I rather chuse to recommend their Use to the Husbandman.

In this View of the first *Georgic*, there is one Thing happen'd to slip my Observation, which relates to the bending of young Trees, while they are growing, to such Shapes as we shall have occasion to employ them in; which certainly would be of good Use for saving both Timber and Labour, and would very well be worth our while to practice.

Explanation of the Figures relating to this Chapter.



The first Plate explain'd, containing the Instruments used by the ancient Husbandmen.

PLATE I. A.

- N^o 1. ὄλμος, *Mortarium*, a Mortar.
 2. ζυγός, *Jugum*, the Yoke.
 3. ἀξίνη, *Ascia*, an Hatchet.
 4. ῥυμός, *Temo*, the Pole or Beam of a Wain, or the Draught-tree, to which the Yoke is fasten'd.
 5. σφίεχ, *Malleus*, the Mallet.
 6. σμίλη, *Scalprum*, a Chisell, or Paring Knife.
 7. τρύπανον, *Terebra*, an Auger.
 8. μάκελλα, *Ligo*, a Mattock, Spade, Hough, or other Instrument, used to digg or break the Ground.
 9. πλύον, *Pala*, an Instrument like a Peel, to toss up the thrashed Corn, that the Wind may blow away the Chaff.
 10. σμινύη, *Bidens*, a Prong.
 11. λυσγάειον, *Furca*, a Pitchfork.

PLATE I. B.

- N^o 1. κλαδευτήριον, *Falx*, a Siccle, or Pruning Hook, or Bill.
 2. λικμητήριον, *Ventilabrum*, the Fann, used as the *Pala*, N^o 9. Plate I. A.
 3. ἄρπη, *Falx Serrata*, a Reaping Hook, used also as a Saw.
 4. αὐτόγυον ἀεστερον, *Aratrum Nativum*, an Original Plough.
 5. ἰσοβοῶς, *Stiva*, the Plough Tail.

6. ἑλμα, *Temo*, the Plough Perch.

7. δὲν, *Dentale*, the Plough Share.

5, 6, 7. ἀεγρεν πικτόν, *Aratrum compactum*, an improved Plough.



PLATE II.

N^o 1. **F**IGURE of an ancient Plough, supposed to be used about the Time of the Romans.

N^o 2. Figure of a *Spanish* Plough, which some suppose, preserves somewhat of the Manner of the *Roman* Plough; only alter'd to be drawn by one Horse, instead of a Yoke of Oxen. 'Tis said, that the Husbandmen in *Spain*, will plough two or three Acres of light Land in a Day with this Plough.

N^o 3. The common Shoulder Plough, or best Plough, used in several Parts of *England*, for cutting or breaking the Surface of Grass Grounds, or Heath Lands; 'tis push'd along by one Man; sometimes cutting the Turf half an Inch thick, sometimes an Inch or two. At A is an Iron turn'd up with a sharp Edge, to cut the Turf from the rest of the green Sward.

N^o 4. Is a Figure of the common Dray Plough, which is good to be used for miery Clays in Winter; but is not so proper to be used in Clays when they are hard.

N^o 5. The Figure of a single Wheel'd Plough, used in *Suffex*.

N^o 6. The Figure of the *Hertfordshire* Wheel Plough, which is of the easiest Draught; proper for any Grounds, except miery Clays, which are apt to clogg the Wheels. The several Parts of this Plough, being understood, will explain to us
the

the Use of the other Ploughs. A is the plough Beam, B the Handle, Tail, Stilts, or Staves, C the Neck, or Share Beam, D the Earth Board, Mould Board, Furrow Board, Shield Board, E the Sheath, F the Share Iron, G the Coulter, H the Plough Pin and Collar Links, I the Plough Pillow, K the Wheels.

PLATE III. Consists of other Instruments which are used in breaking of Grounds, as Spades of several Sorts, Houghs, and other Instruments for Sarrition. The Harrow and Rakes, and Pick-axes, for stocking of Ground, &c.



CHAP. XVIII.

Explanation of PLATE III.

A Is a Figure of the Spade used in *Devonshire*, the Handle five Foot long.

B the Figure of the common Spade, used generally in *England*, with a Crutch Handle.

C The Garden Spade, used generally about *London*. Thus far we have mentioned the Tools for the first opening, or breaking of Ground.

We come in the next Place to speak of those Instruments used for hacking, and breaking of Clods, or for Sarrition, or Houghing.

D A single Sarr, or Pick.

E A double Sarr, or Hough, used in *France*, for opening the Ground among the Vines.

F A three fang'd Sarr, used in *France* for keeping the Surface open.

G The *English* Sarr, or Hough, whose Blade is four Inches broad for Turneps, or less, for other Uses.

H The Pickax, or Stocking Ax.

I The

I The Mattock, made for cutting two different Ways, useful for grubbing of Woods. The Shafts of D, E, F, H, and I, are commonly about three Foot long, and the Shaft of G, is generally five Foot long. After these Instruments, which chiefly serve for lessening the Clods after ploughing, we come to explain those which serve for levelling the Land, and giving its last degree of fineness, and for covering of Seeds.

K Is the Figure of a wooden Rake, either for raking of Ground, as the ancient Writers of Husbandry direct, or for raking of Hay in the Field. The Tail, or Shaft, six Foot long.

L The Iron Rake, for levelling of such Lands as have been plough'd, or dugg, and for burying of Seeds. The Tail, or Shaft, six Foot long.

M A Figure of the Harrow most commonly used, to be drawn over plough'd Grounds by Horses, for levelling and burying of Grain. Sometimes two of these are drawn together over a Field. Besides this Sort, it is common to harrow very light Soils with Bushes, or Bundles of Thorns, especially where Seeds require to be slightly cover'd.

N Is the Instrument call'd the Dibble, used about *London* for setting of Beans.

O The Prong, or Dung-fork, whose Tail, or Shaft, should be about four Foot long.

P The Pitch-fork, whose Tail, or Shaft, should be six Foot long. This is chiefly used for pitching of Corn or Hay into Waggon, the Barn or Mow.

Q The Figure of the Falx, or Bill, used by the ancient Vine dressers, described and figured by *Columella*; with the Names of its several Parts, as they were call'd by the *Latins*. N^o 1. is *Capulus*, or the Haft or Handle. N^o 2. *Culter*, the Culter or first cutting Edge next the Haft. N^o 3.

The

The *Sinus*, the hollow of the Blade. N^o 4. The *Scalpium*, or scraping Edge, or paring Edge. N^o 5. The *Rostrum*, the Beak, or Bill. N^o 6. The *Securis*, the Hatchet. N^o 7. *Mucro*, the Spike. This Instrument is, in every respect, like our Hedging Bill.

R The Sickle.

S The reaping Hook.

T The Sythe.

V The Figure of the Pod of the Plant call'd *Tribulus terrestris*, so named because of its Points standing in this Manner, like the *Tribulus*, or *Cal-trop* used in War. The *Tribulus* which the Ancients used to separate the Corn from the Ear, or Straw, we are told, was so named because of its Form; it might be perhaps made of Rollers; with Teeth set in this Manner, and so placed as to work together; and the Ears of Corn, which had been coarsly separated from the Straw, by passing between them, might separate the Corn from the Husk; I mean the *Frumentum*, not the *Adoreum*, for that I have already mentioned, with the Manner of preparing it.

W The Figure of a Flail used in *England* for thrashing of Corn. I might also have added the Figure of a Van, or Fan, or Machine for winding of Corn, to separate it from the Chaff; but every Farmer has one.



C H A P. XIX.

Of the Elm, Vine, Olive, and the Method of encreasing them ; from Virgil, Columella, and others of the ancient Writers of Husbandry.



Shall in this Chapter first mention the Elm, because it was a Tree which the Ancients had in great Esteem, for the several Uses they made of it in their Works of Husbandry, and Browse for Cattle ; and especially for the Use of their Vineyards. This was in a Manner their chief Support ; for it was a Custom among the *Romans*, to plant Elms at wide Distances in their Fields, and to train up Vines at the Foot of the Elms, in such a Manner that the Vines might, in length of Time, intermix themselves with the Branches of the Trees, and bring their Fruit out of the reach of the Cattle. And tho' it is at this Day frequent in *Italy* to see Trees cover'd with Vines ; yet in our Climate we have but few Sorts that perhaps would Ripen with such Management, There is this indeed to be said, that Elms will draw out a great Share of the Moisture from the Grounds they grow in, and by that Means make them the more fit for Vines, which love dry Grounds. Besides, as we find from the Custom in *Italy*, that the Shade, or Drip of the Elm, is not Injurious to the Vine ; nor even the Shade, or Drip of the *Ilex*, or ever green Oak, as one may observe in several Places of *Italy*. Then, I think, it would

would not be unworthy our tryal of it with us, in some of the forward Sorts of Grapes. But I conceive, that there is so great a Harmony between the Vine and the Elm, that the Vines educated near Elms would ripen their Fruit sooner than those in open Ground; for Vines do not love Dews, as we plainly see in the Difference between those which grow upon the Hills, where no Dews come of any Consequence, and those growing in the Vallies, which always are subject to Dews; and it is observable, that where the Ground is very much dry'd, there is no Dews; and I suppose the Elm dries the Ground so much about it, that there either are no Dews about it which are hurtful to the Vine, or else what Dews there are the Elm takes to itself; I think therefore we ought to try, since we have all the ancient Writers to direct us, and not only modern Experience from abroad, but at home too, that a Vine loves a dry light Soil, free from Dews; or if it happens to be planted in a stiff Soil, it thrives the better to have Plants growing about it, unless it be the Colewort, or Cabbage, which, as *Pliny* observes, is a profess'd Enemy to it; for these Plants draw in their Nourishment by Wholesale, they spare nothing they can lay hold on, while other Plants only take their Share, and leave enough for the rest; but the Cabbage, or Colewort is a meer Hog, it feeds upon every thing, and is so great a Glutton, that it allows no Nourishment to its Neighbours wherever it grows; and for this Reason it is common to plant Cabbages in such Places as are used to be overgrown with Weeds, for by its gormandizing Quality, and the great Shade of its Leaves, it destroys the boldest Weeds.

But my Business is at present to speak of the Elm, as the Ancients direct us, in its Management, of which I shall mention only a few Particulars,

ticulars, as far as they relate to my present Purpose.

Columella tells us, there were two Sorts of Elms known in his Time, one which he calls *Ulmus Gallica*, and the other *Vernacula*, or *Italica*. *Theophrastus* calls them *Montiulmus*, or *Montosa Ulmus*, and *Ulmus Campestris*; and *Pliny* makes four Sorts of Elms, the *Atinia*, *Gallica*, *Nostras*, and *Sylvestris*. But it is plain, these four Names which *Pliny* mentions, belong but to two Sorts, for his *Atinia*, and *Gallica*, are both one Sort, as *Columella* witnesses, and is the same with *Theophrastus's* *Montosa*, *Pliny's* *Nostras* and *Sylvestris*, are likewise both one Sort, and are the same with *Columella's* *Vernacula*, which, as I said before, is called *Italica*; and the same also of *Theophrastus* *Campestris*; the *Ulmus Vulgaris*, or most common Elm, agrees with the *Atinia* of *Pliny*, the *Gallica* of *Columella*, and the *Montosa Ulmus* of *Theophrastus*. The *Ulmus latiore folio*, which is our broad leav'd Elm, or Witch Hazle, is agreeable to the *Vernacula* of *Columella*, and the *Nostras* and *Sylvestris* of *Pliny*; the Seed of the Elm is called *Samera*, which both these Kinds produce plentifully; tho' *Tremellius* did not allow that the *Atinian* Elm brought forth any *Samera*; but we find the contrary, for this yields Seed as plentifully as the other, only it is apt to be hid among the Leaves; this *Atinian* or *Gallican* Elm, was therefore only raised from Sets by the Roman Husbandmen, and makes a much taller and more luxuriant Tree than the *Vernacula*, or Witch Hazle, and its Leaves afford a much better Browse for Cattle; than the Leaves of the *Italian* Elm; so that if we feed them first with the *Atinian* Elm, they will hardly relish the other afterward; so that the *Atinian* Elm should chiefly be planted in all our Works, where Elms are necessary for the Sake of its Browse for Cattle. But, if we cannot compass a sufficient Number of Elms to train
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our Vines upon, we may make up the Loss by planting the *Opulus*, or Maple, which next to the Elm, the Vines take most delight in; or for want of this, the Ash is approv'd by many, because it affords an excellent browse for Goats and Sheep; nor is it unprofitable to the Ox. This does best in rocky and mountainous Places, where the Elm does not prosper.

Columella then goes on to prescribe the making of *Seminaries* and *nurseries* of Elm and Ash, by sowing the *Samera* of the one, and the Seed of the other; for he says, the Maple is better rais'd by Suckers from the Root; tho' in this I differ from him, for all the Kinds of Maples bring Seed in Abundance, and are easily raised from Seed, and grow quick.

The *Samera* of the Elm, he tells us, when it has lain in the Sun a few Days, will look red, and must then be sown very thick, in Beds of fine Earth, before the Seed be too dry, covering them a Finger's breadth with Earth, and sprinkling the Bed with Water, the whole should then be cover'd with light Straw, to keep the Birds from the Seed, which they will greedily devour, as soon as it begins to sprout; when the Seed is come up, no Time should be lost to weed the Beds, which must be done with the Hand very carefully, without disturbing the Roots of the young Elms. We should also observe in the making of these seedling Beds, to make them Narrow enough, that the Weeders may not have occasion to trample on them when they weed the young Plants. In the Summer they must be frequently refresh'd with Water, either in the Morning before the Sun rises, or in the Evening. After the Plants are strong enough to remove, let them be transplanted in Lines, preparing Trenches for them, and observing to set their Roots, after they are prun'd, in fresh Cow Dung, and the Earth press'd

press'd close down about them. I think this Contrivance of *Columella's* is an excellent Discovery, not only for Elms, but almost any other Tree we design to transplant; for besides the keeping of the Roots cool, the fresh Cow Dung closes as well about the Roots as any fine Mud we can prepare; and has this good Effect, that it does not bind so soon as some Sort of Mud will do, but gently, by Degrees parts with its Moisture, 'till it becomes an Earth of the finest Sort, that Benefits the Roots that are near it. And so likewise it is recommended by *Columella*, to raise young Sets of Elms in Cow Dung, which must certainly succeed very well; he also directs, that whatever Tree we plant, should not be pruned 'till the second Year, which I have experienced is right, and contributes greatly to the welfare of any Tree, as I have observ'd in several Places of my Works, where I have had Occasion to shew the Use of my System of the Circulation of the Sap in Vegetables.

When we plant these Trees out where they are to grow, he directs them to stand at forty Foot Distance in Lines, to run *East* and *West*, for the better admission of the Sun to the Vines which are to run upon them. The Stems of these Trees, he tells us, should be clear of any Branches, about nine Foot from the Ground, that all the Boughs should be out of the reach of the Cattle; upon any amputation he directs, that the wounded Part be immediately cover'd with a grafting Loam, that it be not damaged by the Sun, or Rain.

When we plant our Vine, we must observe that our Elm be not too old, nor must we match a young Elm to an old Vine, for the Elm will destroy it; but let them be near the same Age or Strength.

In the planting and raising of Vines, I do not find any thing among the ancient Writings, that
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can furnish us with better Instructions for their Management than we have already; the raising of Vines from Cuttings, and Layers, we know as well as the grafting of Vines, which is mentioned by most of the ancient Authors, all which may be seen in my Monthly Writings fully set forth, which therefore I omit in this Place. Concerning the Variety of Grapes, both *Columella* and *Virgil* name a great Number, the *Methymnean* Grape, so call'd from a City of *Lesbos*, famous for good Wine. 2. The *Thasian* Grape, from *Thasos*, an Island in the *Ægean* Sea, chiefly commended for its high Flavour'd white Grape. 3. The *Mareotick* Grape, a white Sort, or the Grape of *Epirus*, as *Columella* says, though some place *Mareotis* in Part of *Ægypt*; this, we are told, is proper for light Ground, but the former will bear a stiffer Soil. 4. The *Psythian* Grape of *Virgil*, is a Greek Grape of *Columella*; this made an excellent Wine, the Grapes being first dry'd by the Sun upon the Vines; which Sort of Wine, made of dry'd Grapes, was call'd by the *Latines*, *Vinum passum*, which the Ancients had in high Esteem, as will appear from *Plato's* saying, that Men that were made free might eat of Figs and Grapes, which could not be preserv'd; but as for dry'd Grapes, of which Wine was made, by no Means. 5. The *Lageos* Grape, took its Name from the Greek Word *λαγεις*, signifying a Hare from that Colour, and therefore is call'd in *Latin*, *Uva Leporaria*. 6. The *Rhetick* Grapes, grew about *Verona*, and were mentioned by *Virgil*. but with some doubt whether he speaks of them with Praise, or otherwise,

*Et quo te carmine dicam
Rhetica? nec cellis ideo contende Falernis.*

For my Part I conclude, that he only prefers the *Falernian* Grape to them. And we find, *Suetonius* is not contrary to this Opinion, when he says. *Maxime delectatus est Rhetico*. But besides, as *Augustus* was a great lover of the Wine made of this Sort of Grape, it would not have been extremely Prudent in *Virgil* to have given it an ill Name: But the Manner of his Expression seems to signify no more than if it ought to give Place to any Grape, it should be the *Falernian*, which is a seventh Sort, or perhaps may be one of the former Sorts, but may make a different Wine, only from the Place of its growth; for it was named from a Hill called *Falerus*, where it grew, and from several Parts of this very Hill there came several Sorts of Wine, the sharp, the sweet, and the mil'd; the Wine growing on the Top was call'd *Gauran* Wine; that in the Middle of the Hill *Fauslian*; and that at the Bottom *Falernian*; which last was highly esteem'd, and judged to be preferable to all others, as is express'd by one of the Ancients, when he says, *What Barley is comparable to the Apulean? What Wine comparable to the Falernian?*

8. The Grape which made the *Aminean* Wine, called the *Aminean* Grape, from *Aminum* a Town in *Campania*; though some believe otherwise. 9. The *Tmclus* Grape, or Wine from a Mountain in *Lydia*. And 10. The *Phaneus* Grape, or Wine from *Phaneus*, a Mountain in the Promontory of *Chios*, which *Servius* tells us, was so called from King *Phaneus*. But the Title of King, given by *Virgil* to this, — *rex ipse Phaneus*, is by some applied to the Excellency of the *Chios* Wine, as having a Merit, or being superior to all the rest. But the *Falernian* still, in my Opinion, *Virgil* esteem'd the Flower, by the Comparison he made between that and the *Rhetick* Wine; though *Lucius Cordus's* Opinion is, for the *Chios* Wine to be superior

rior to all the rest. 11. Is the smaller *Argit*, which seems to be so called from *Argis* from whence it came; though some say from its being a white Grape, or producing a white Wine, taking its Name from the Greek ἀργεῖος which signifies White: This was chiefly commended for its Sweetness and lasting Quality; of which there were two Kinds, the Greater and the Lesser; the Lesser is held in great Esteem by *Columella*. 12. The *Rhodian* Grape, which is differently understood, whether the Wine or the dry'd Grapes were to be commended, some giving their Opinion, that it was Wine serv'd at the second Tables; and others, that the dry'd Grapes of this Sort were brought in with the second Courses; which agrees with *Martial* and *Horace*. But see *Virgil*.

*Non ego te, mensis & Diis accepta secundis,
Transferim, Rhodia,*

Which, I think, is best translated by the late Commentator upon *Virgil*.

*Nor shall ye want the Tribute of the Muse,
Whom no proud Board, nor Gods themselves refuse,
The Rhodian thou—————*

13. We have the *Bumaste*, a Grape brought from Greece, so call'd from its Bigness and Figure, as *Pliny* says, *tument vero mammarum instar Bumasti* *Bumaste* is from the Greek Βεμαστος *vaccæ mammæ magnitudine referens*: Or *Bumamme*, according to *Varro*: Or, as *Columella* has it, *Bumammia*; and *Pliny* with him, like the Udder of a Cow; I suppose the Bunch is as large, and not to have Grapes as large as Cows Teats, as some would suppose. But here we have an End of the favourite Kinds of

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Grapes;

Grapes; but according to *Virgil*, there was no End of numbering the Sorts which were known in his Time, when he says,

*Sed neque quam multæ species, nec nomina quæ refert
Et numerus; neque enim numero comprehendere
Quem qui scire velit, Libyci velit æquoris idem.
Discere, quam multæ Zephyro turbentur arena:*

Which is thus given us in *English*, by the late Commentator upon *Virgil*.

*But of their Kinds and Names there is no tale,
Nor would their Numbers ought my Song avail;
Who this would know, the same would count the Sands
Tempestuous Zephyrs toss on Libyan Strands.*

I have chiefly taken Notice of the Naming of Vines, or Grapes, after the Manner of the Ancients; that our Modern Practitioners may judge a little of the Design of Naming of Plants and Flowers. We see here, that the Name of every one of the Grapes mentioned, leads us to the Place where the Plant originally grew, or had its Name, because the Name indicated its Properties: We can by these Names give a good guess at the Sorts, and if we had them, would know how to manage them. But if one of our Gardening Catalogues of Plants, should be found fifteen Hundred Years hence, the Names contain'd in such Catalogues only, might be enough to confound the Histories of our Times, where would be seen such a jumble of Names and Titles of Great Men, who lived at different Times, that it would be suspected the Historians had given false Accounts of the Times we lived in; and yet such Lists, perhaps, might be found in the Libraries of great Men, and in a few Hundred Years

Years may be look'd upon as Papers of Consequence relating to the Times they were Writ in ; it would not occasion a small Merriment to copy one of these Catalogues, wherein the Titles of all the great Men, and celebrated Beauties in *England* would appear together, as if there had been a general Meeting. But one of the Tattlers has already been very merry upon this Subject.

The next after the Vine is the Olive, which the Ancients tell us, is propagated from Truncions put into the Earth, without any Root ; and tho' they will remain for two or three Years without making of Roots, we are not yet to despair, for they have an Oylineſs in their Juices, which tho' it keeps the Truncions from striking Root in a long Time, yet hinders their more watry Juices from putrifying, or rotting the Stem. This Plant, all our ancient Writers tell us, gives no Trouble to the Husbandman, he sticks it in the Ground, and there it grows and brings Fruit. And, as *Virgil*,

Sed truncis Oliæ melius — — —

But the Truncions of Olives are best for planting.

These however may be raised by Layers, and from Suckers growing about their Roots. As for the Soil, *Virgil* tells us, they love a stiff Clay, or a tender Chalk, somewhat Stoney. The several Sorts of Olives may be all grafted upon one another : Or, as the Ancients tell us, upon the wild Olive likewise. *Columella* tells us, there are ten Sorts of Olives ; and *Macrobius* mentions seventeen Sorts : but *Virgil* mentions only three Sorts, viz. the *Orcades*, the *Radii*, and *Pausian* ; the first has its Name from the Roundness of its Fruit, and the second from the Length of the Fruit, as *Isidore* tells us, *Lib. 17. Radidæ pro eo quod oblongæ sunt in modum*

Radiatorum; the third has its Name *apaniendo*; as *Cato*, *Servius* and *Isidore* observes, meaning to stamp or pound, because they are pounded for Oyl. But the two other are fitter to eat, this last being bitter, as *Virgil* observes,


————— *amarâ pausia bacca.*

I have already try'd several Sorts of Olives in *England*, without giving them any Shelter in the Winter, and I find them to prosper very well, and bring ripe Fruit; so that I do not despair of seeing Olive Gardens in as good Perfection in *England*, as they are in *Italy*; especially since I hear, that a Gentleman has sent to *Genoa* for an Hundred Plants of Olives to begin with. The Figure of the Plant see in the Table.

In the Works of these ancient Philosophers we also find, that they had three Ways of Engrafting, one by Infection, which is the common Way; another by Terebration, or boring into the Stock, and placing the Cions in those Cavities; and the third was by paring off the Rind of two Vines that grew together, and binding them Close, which two Ways of boring and joining of Plants are the surest Ways of Graffing, tho' now little used. Besides these, we find mentioned two Sorts of Budding, one call'd Inoculation, and the other Emplastration; both which are explain'd in *Dr. Agricola's Philosophical Treatise of Planting*. But I shall now proceed to speak of the Gardens and Graffings of the Ancients.

C H A P. XX.

Of the Gardens of the Ancients, and of
Grassing.

T is observable in the Gardens of the Ancients, according to *Columella*, that their chiefest End was the Culture of such Plants as were either useful in Diet or Medicine: As for Flowers, we find little Notice taken of any, except the Rose, the Lilly, the Violet, the *Narcissus*, the *Leucoium*, and the *Hyacinth*, which were set promiscuously without Order: But their Kitchen-Herbs and *Legumes* were disposed in Method, on such Beds as were narrow enough for the Weeders to go about and do their Business without leaning upon them. We find they had Varieties of the Cole Kind; they had Artichokes, Gourds, Melons, Cucumbers, Beans, Peas, Lupines, Cicers, Kidney-Beans, Capers, Fennel, Annis, Mustard, Onions, Parsly, Leeks, Lettice, *Amaranthus*, Marjorum, the Bay, Cresses, Thyme, the *Acanthus*, Coriander, Cummin, *Asparagus*, white Beets, Basil, Rocket, Hoarhound: Their Fruits were Grapes, Apples, Pears, Plumbs, Figgs, Cherries, Quinces, Peaches, and Water Melons, which they call'd *Citruls*.

The Order in which they disposed their Fruit-Trees, was that of the *Quincunx*, which is well enough represented on a Die in the *Cinque*, or Number five, for Trees planted in this Manner appear in Lines every Way; but then Care was

taken that the Trees should stand at such Distances that their Shade should not be any ways hurtful to the undergrowth. This likewise was strictly observed in such Plantations as they made in their Fields, when they planted Elms for the support of their Vines; for *Italy*, as well as *Greece*, are in such happy Climates, that there is no Occasion to help any of the tenderest Garden-Fruits with Walls

It was also one of their first Works, when they laid their Designs for Gardens, to make *Aqueducts*, that they might be plentifully stock'd with Water, which especially is necessary in hot Climates, and cannot be wanting in the Farms and Gardens of the colder Countries, such as *Great Britain*; indeed no Place, wherever Plants are cultivated, can turn to any Account without Water, nor without being well fenced from Cattle, which was another great Care among the ancient Gardiners.

The *Romans*, upon receiving the choice Sorts of Fruits, which the *Greeks* had collected from the several Parts of the *Eastern* World, had recourse to many Sorts of Graffing for encreasing them; the Ways they practised were Emplastration, or Budding, or Inoculating, and Inarching and Uniting, by joining or approaching the tender Shoots of the Cyon, and the wilding together while they were growing: They knew Cleft, or Stock-Graffing, as well as Whip-Graffing, all which are common enough known with us not to want any Explanation; besides which, they had that Invention which they call'd Terebration, or Boring, which I have practised two Ways, *viz.* by making an Incision, sloping a little downwards, into the Wood of the Tree; but this must be done with such an Instrument as will not tear the Bark, or the Wood; it should be made somewhat like the Instrument which the Cheesmongers use to taste
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their Cheeses; this being done of a convenient Depth, fit the Cyon to it, and taking off the Bark from one Side of the Part which it is to go into the Wound, fix the Cyon as it should be, and brush over it a little Graffing Wax: The other Way is, to slip a small wooden Wedge between the Bark and the Wood of the Tree, and then taking off the Bark on both Sides the Cyon, towards the Bottom make it like a Wedge, and slip it into the Wound, fixing it with Graffing Wax, like the former. As for the Graffing in the Root, it is done by first cutting some of the larger Roots pretty deep in the Ground, and raising the wounded Parts out of the Earth four or five Inches, letting them so remain a full Season before we attempt to graff upon them, which Operation must be perform'd like other Graffings.

These were the Graffings of the Ancients, who understood that all Trees which were of the same Tribe, though different in some Sort, either in Make of the Leat, Colour of the Flower, or Flavour or Figure of the Fruit, might be graffed upon one another. The Pomgranates, they tell us, will take one upon another, but upon nothing else. The Apple, they inform us, will take upon the Pear; the Hawthorn, the Service, the Medlar, and some say, upon the Sallow, the Plane-Tree, and the Chestnut. The Peeches upon one another, and upon the Plum. The Quince, they tell us, will only take upon itself; but we find it will do upon the Pear. The Medlars will take one upon another, and may also be graffed upon the Pear and the Hawthorn. The Lemon, we are told, will take upon the Pear and the Quince. Plumbs, we are told, besides being graffed upon one another, will take upon the Chestnut. The Ancients tell us, that Figgs may be graffed upon one another, and upon the Mulbery; and by some up-
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on the Plane-Tree. The Mulbery, they tell us, may be grafted upon the Figg, and also upon the Ash, the Chestnut, and the Beech. The *Sorbus*, or Service, is grafted upon the Hawthorn; and some say upon the Quince. The Cherry upon the Plumb, and the *Laurocerasus*, or Cherry Bay; and some say also upon the Plane-Tree. The Almonds upon one another, and upon the Plumb and the Peach; and also upon the Chestnut. The *Pistachio* is said to take upon the Almond, and upon the *Terebinthus*. The Chestnuts upon one another, and upon the Willow. The Hazels upon one another, and upon the Hawthorn; which last I have seen upon *Marlborough* Forest, where the Hazel and Hawthorn grew so close together that they became one Body.

The Vines likewise, we are told, may be grafted upon one another, by approaching the Branches of one Sort to the other. and by grafting in the Shoots of Vines, cut an Inch under Ground.

The Olives are grafted upon one another, and also upon the *Oleaster*.

Pears upon one another, and upon the Quince, upon the Hawthorn, upon the Service, the Medlar, upon the Apple, upon the Ash, upon the Chestnut; and by some upon the Pomgranate.

The Arbor Molly upon the *Lentiscus*.

In these Graftings I confess there appears some Difficulties, if we were to look no further than the common Way of Grafting; but when we consider their Manner of approaching and binding the Twiggs of different Trees together, 'till they grow into one another, one may reasonably conceive, that there is not a Sort of Tree upon Earth but what we may join with another, if we allow Time enough for the Operation.

In the next Place I come to take Notice of the State-Gardens of the Ancients, how they were design'd

sign'd for Grandeur; the Fashion, or Taste of the Greeks and Romans, in such Grand Gardens, was to make them free and open, to consist of as much Variety as possible; to afford Shade, and give a refreshing Coolness by variety of *Fet-d'eaux* and Water-falls. When they laid out their Gardens in any Figures (for I do not find that they ever used Knots or Flourishes) those Figures were either Squares, Circles or Triangles, which they commonly encompass'd with Groves of Pines, Firrs, Cypress, Plane-Trees, Beech, or such like; in some convenient Place they also contriv'd their *Ornithons*, or *Aviaries*, for breeding and feeding of choice Fowls for the Table; add to this their Fish Ponds, which served to maintain their Water Fowls, and in which it was a Custom to have moving Figures, contriv'd by a famous Clock-Maker at *Athens*, which, by the Motion of the Waters, were continually in Action, which Piece of Art was held mightily in Esteem. This was the Humour of the Gardens of the Ancients, which, in my Opinion, we have hardly mended by our extraordinary Regularity; which, however it may appear well on a Paper Design, is stiff and surfeiting when it comes to be put in Execution. In our Modern Designs we see all at once, and lose, the Pleasure of Expectation; fine irregular Spots of Ground, which in themselves had ten thousand Beauties, are brought to a Level at an immense Expence, and then give us so little Amusement, that the Charge is generally regretted, and the Spirit of Gardening, which began to grow in the Gentlemen who have been at the Expence of such Works, sinks, and concludes in a Resolution of abandoning their Designs of Gardening; so that in such a Case, the Surveyors do not only do themselves a diskindness in making expensive Works, which carry nothing entertaining in them, but

but instead of promoting the Business, are indeed the chief Discouragers of it; and even in the best Performances in this Way, a good Judge cannot help discovering the *petit goût*, except in such Gardens as we find at the Earl of *Burlington's* at *Chiswick*, where the Contrivance and Disposition of the several Parts, sufficiently declare the grand Taste of the Master.

But I am not a little pleased to find, that every Surveyor and Undertaker of Gardens has not the same stiff and contracted Genius; Mr. *Benjamin Townsend*, a Surveyor at Mr. *Whitmill's*, an ingenious Gardiner at *Hoxton*, is an Instance of a free Genius, his Works convince me of his Capacity of doing great Things; and of his considering how to contract the Expence which is no less Commendable; his Designs shew us his Judgment in Preserving and even Improving the natural Beauties of an irregular Ground, especially where there is any Advantage to be made of Wood and Water, which are two of the most delightful Furnitures of a grand Garden, where they are managed with Skill, and especially in the Distribution of Water, which he so well knows how to turn to the Advantage of Land; at the same Time he gives us the Diversion of it in Jets and Water-falls; and I conceive, where we have these Beauties added to the other of Hills and Vallies, one must certainly expect every Thing which can contribute to render our Gardens delightful, after the hurry of Business; and we might still improve these Agreeables, if we were to borrow so much from the *Versailles* Gardens as one might take in at small Expence, such as the Fables of *Æsop*, to be here and there intersperc'd in our Woods, represented by Figures as big as the Life, of Men, Birds and Beasts, painted in their natural Colours; and more especially how extremely might the Delights
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of such a Place be heighten'd, if in some Part of the Wood there should be placed, either in a Summer-House, or *Grotto*, such a Musical Machine, as has been lately invented by Mr. *Pinchbeck*, the famous Clock-Maker in *Fleetstreet*, which by Means of Water may Play perpetually, and give us the agreeable Entertainment of *Symphonies*, *Airs*, *Sonata's* and *Concertos* upon Flutes, *German Flutes*, Trumpets, and other Instruments, performing compleat Conforts when we are remote from good Performers, and our Mind is disposed to Solitude; such an Entertainment, I say, where the true Taste of the Musick is kept up, and the Graces are rightly adapted, as appears in all Mr. *Pinchbeck's* Pieces of this Sort, must surely render such a Retreat delightful beyond Description; where this happens to be, it would be no small Addition to the Pleasure we propose from it, if the bye-Walks were so order'd, that one could not come at once upon such a Summer-House, but be led to it by Degrees, first hearing the Musick faintly, and then led insensibly from it, and by turns losing and recovering it, 'till at length we came to enjoy its Harmony compleat. I think nothing could be more enchanting than a Thing of this Nature, and yet need not be of any great Expence, as far as I can understand, where there is the Command of Water. Here likewise we might have *Grotto's* and Caves, disposed in a Rustick Manner; and at certain Points of View, *Obelisks* might be placed, or Summer-Houses, or Pavillions, built after the Manner of *Grecian* Temples, to be planted about with Firr-Trees, at such Distances as not to obstruct the Sight; 'tis in this Manner I conceive a Garden may be made more delightful, and possess more Beauties than any Garden we have yet in *England*. I shall now proceed to treat of the Methods used by the Ancients for the Education of Fowls.

C H A P.



C H A P. XXI.

Of Birds and Fowls; the several Sorts which were in Request among the Ancients; of their Penns and Manner of Keeping them, &c. from Varro, Columella, and others.



THE Penns in which the Ancients used to keep their Fowls, were call'd *Ornithons*, from the Greek *ὀρνίθων* which signifies a Bird Penn; this, says *Varro*, has gain'd the greatest Esteem from the Thrushes that are fatned there. *Merula* tells us, there are two Sorts of *Ornithons*, or Bird Penns, one for Pleasure, and the other for Profit: The Cooks in *Rome* were always provided with the latter; but in the Country, among the *Sabines*, there were many Penns of this Sort to be lett to hire, there being, in that Country, vast Flocks of Thrushes, which came yearly from abroad. *Lucullus* had a third Sort of *Ornithon*, which he built at *Tusculum*, and call'd an *Aviary*; this he join'd with his Dining Room; but this he soon grew weary of, the Pleasure of seeing the Birds nor being sufficient to countervail the offensive Smell they occasion'd.

The *Ornithon*, or Bird Penn for fatning of Thrushes, should be a large Room, capable of containing several Thousands of Birds, among which some use to put Black Birds, and others that may be made fat, and render'd fit for the Table, such as Linets, Quails, &c. which sell at a great Price when they have been well fed; the Water should run through this House in narrow Troughs, which
may

may easily be cleaned: And besides, these narrow Gutters are the best for the Water, because if the Water should be too diffused it will sooner corrupt, and become unpleasant and unwholesome to the Fowls: The Entrance into this Place should be low and winding, like the Doors that lead into the Pits of Amphitheaters; and the Lights, or Windows, likewise should be very small, and so contrived, that our Birds within Doors, should not see those that are abroad, or have the Sight of any Tree, for the Sight of them would make our mew'd Birds Pine, and fall off their Fat; in a Word, they should have no more Light than is necessary to guide them to their Meat and Water, or to let them see their Way to their Perches, which should be many, and set cross ways. The proper Meat for fattening these Birds, is made of Figgs and Meal bruised together, and made into Balls. Twenty Days before we kill these Birds, we must give them Meat and Water in greater Quantity than we did before, and their Meal should be finer.

Joining to this large *Ornithon*, should be a smaller, into which we should put those Birds we design for killing; this small Bird Penn is call'd *Seclusorium*, it has a larger Door, and more Light than the former; we here kill the Birds we have occasion for, because, were we to kill them in the great Penn, the other Birds would be frightned, and languish.

This Sort of Thrush, as is observ'd before, is a foreign Bird, or Bird of Passage, coming every Year into *Italy* about the Autumnal *Æquinox*, and returning again at the Vernal *Æquinox*, not staying to breed in *Italy*. The Turtles and Quails also are Birds of Passage; but make their Flights to and from *Italy*, at other Seasons, in vast Flocks: It is observable in the Passage of these Birds, they stop to rest themselves, before they reach *Italy*, in the
Neigh-

Neighbouring Isles *Pontia*, *Palmaria*, and *Pandataria*, where they stay for a few Days, as likewise they do in their Return from *Italy*. *Appius Axio* observes, that if there happens to be any great Feast at *Rome*, or publick Triumph, when these Birds are lodged in the Islands, that to bring from thence about five Thousand, they may be sold for an immense Price. Here *Varro* speaks of another Sort of Ornithon, which was built by one of his Friends, under Mount *Cassin*, which, he says, out-did those of the Inventor. *M. Lenius Strabo*, who being at *Brundisium*, was the first who had Birds confined for fatning; but these, he says, were only kept from Liberty by a Net; but likewise he tells us, that this new one was far superior to that of *Lucullus* at *Thusculum*; and in the Description of his own, he speaks of giving Light to the Birds by Canvas instead of Nets.

He, in the next Place, gives us some Instructions concerning Peacocks, first telling us, that *M. Aufidius Lurco* got above 6000*l.* one Year by these Fowls. He observes, that the Males ought not to be so many in Number as the Females, if we regard our Profit: He adds, that the Males of this Sort, which come from *Samos* and *Juno's Grove*, are the most beautiful; these are also reckoned the best Breeders, if they are taken at a proper Age; but we must take Care that they are not too young when they tread the Hens. They feed upon all Sorts of Grain, but upon Barley especially. *Sejus* directs us, to give them more Meat than ordinary before they begin to couple; he also computes three young ones from each Hen, or after that Rate, one with another, which, when they are grown up, he sells for fifty Pence each; and to make the greater Profit of these Birds, he set Eggs of them under common Hens, and when they are Hatch'd, carries the young ones among the other Peacocks,

Peacocks, which he keeps in a large Place, wherein are several Apartments, which are so fenced as to keep out all Sorts of noxious Vermin: These Fowls ought likewise to have some open Place, where they may be turn'd out to feed when the Sun shines; this is a very clean Bird, and therefore the Keeper of them should be diligent to go round their Apartments with a Shovel, to remove their Dung, which may be lain by for enriching of Ground. *Q. Hortensius*, upon one of the *Augur's* Feast Days, was the first who had this Sort of Fowl served up to the Table; but it was better approved by the luxurious, than by the soberer Part of the Company: But however, this quickly became a Custom, which increased their Price extremely, so that even their Eggs were sold for six Pence a Piece, and a Hundred of the Fowls for four Thousand Sesterces.

Of Pidgeons, *Varro* tells us, there are two Sorts, the Wild and the Tame, the first Sort is call'd *Saxatiles*, because it delights in Turrets and Tops of Houses, their natural Temerity making them frequent the highest Places; these are of divers Colours, without any White in them: But the tame Sort is all White, and is so Familiar as to feed at the Doors of Houses, and in the Streets. Some have supposed a third Sort, from having white Feathers mix'd with the other Colours; but this only proceeds from the Wild and Tame coupling together. 'Tis common to have about five Thousand Pidgeons belonging to one House, which must be a large Room, with one narrow Door, and such Windows as they have in *Africa*, or Larger, being reticulated, or made of Lattice Work; these Windows should be on both Sides to make the Room Lightsome, for the Management of these Birds is very different from the Birds of Passage mentioned

before: However, all the Parts of this Room must be so contriv'd, that no Serpent, or other noxious Animal can get into it; and particularly take Care, that there is no Harbour for Mice, or Lizards, for there is no Bird, or Fowl, so timorous as a Dove.

Varro goes on to direct, that each Pair of Pidgeons should have an Appartment to themselves, the Inside of every Appartment to measure three Spans every Way, and these Appartments to be close set together, in Rows one above another, from the Bottom to the Top of the Room, and under each Row there should be little Boards, two Spans long, for the Pidgeons to rest upon when they go in and out of their Cells.

The Water which is let into their feeding Place should be very clean and pure, as well for them to drink as to wash themselves, for this Bird delights in Cleanliness, and will not thrive where it has not a good Conveniency of Water; and so likewise their Dung ought to be frequently taken away, and preserv'd for the enriching of Grounds. But it is necessary that the Pidgeon should have a Place to air itself, for if it be confined too close, it will languish and grow distemper'd. Their Meat should be given them in narrow Troughs, which should be supply'd by Pipes from another Place, so that they may always have enough to eat, but none to spoyl. The Food they chiefly delight in is Millet, Wheat, Barley, Pease, *Orobis*, &c.

There is no Bird so Fruitful as the Pidgeon, it conceives and brings forth in forty Days; that is, she hatches her Young, and brings them up in that Time; and this is what she does the greatest Part of the Year, only having a short interval between the Winter and the Vernal *Æquinox*; the Pidgeon brings forth two at a Time, and as soon as the
young

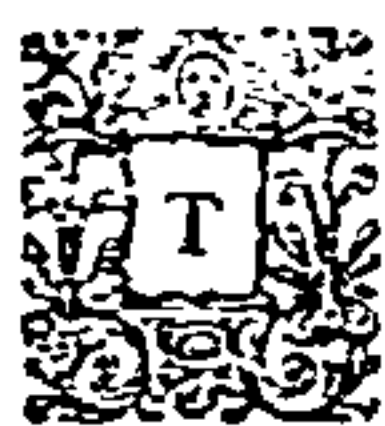
young ones are full grown, and have got Strength, they then begin to lay.

Those who have a mind to fatten the young Ones in order to their selling for a better Price, must put them into a Place by themselves as soon as they begin to be feather'd; we must cram them with Paste made of the whitest Meal, twice a Day in the Winter, and three Times a Day in the Summer, in the Morning, at Noon, and in the Evening, and as soon as their Wings begin to be well feather'd we must break their Leggs, and leave them to be fed by their Dams, who will feed both them and themselves the whole Day through, and the Flesh of these will be much Fatter and Whiter than others; a Pair of Pidgeons that are of a good Size, and a right Breed, will bring a very large Price at *Rome*. Besides these Birds, which were in the most particular Esteem among the Ancients, we have the Pheasant, the Goose and Duck, besides the common Poultry mentioned by them: But Turkeys I do not find were then known to the *Romans*, though at present they are every where in *Italy*. However, the keeping of Pheasants is a Thing so difficult, if they are confin'd, that I think the Method we have of doing it, will be sufficient for those who have a Mind to practise it; and for the breeding and keeping of Geese, almost every one knows how to do it; however, of these, and of the common Poultry, I have given large Directions in my other Works. Nevertheless, we may say this of Fowls, such as common Poultry, and Ducks, and Geese, the meanest Cottages may venture upon them, with regard to expence, for they are able to shift for themselves, and there is a large Profit to be made of their Eggs, their Bodies, their Brood, and their Feathers.



C H A P. XXII.

Of Cattle, some Particulars relating to them, mentioned by the ancient Writers: Which are the least observ'd in England.



THE Domestick, or Tame Cattle, which we find were chiefly kept by the ancient Husbandmen for Profit, were Horses, Kine, Sheep and Goats; and we find hinted by some of them, the enclosing of Places for Deer, Hares, and even of some dangerous wild Beasts, as wild Boars, &c. But as far as their Directions tend to the propagating of Savage Animals, I can see no Reason for introducing them among us, in a Country where one great Blessing we enjoy is, the being fenced by Nature from every Kind of voracious Creature, so that I dare say my Reader will excuse me, if I omit that Part of the ancient *OEconomy*. I shall therefore only treat of those Cattle which are most agreeable to our Husbandry.

What we learn chiefly relating to Horses, from the Ancients, is concerning their Make, and the Breeding of them. The Description of a fine made Horse, *Virgil* gives us in the following Lines:

————— *Ille ardua cervix*
Argutumque caput, brevis alvus, obesaque terga;
Luxuriatque toris animosum Pectus, honeste
Spadices, glaucique; color deterrimus albis,
Et glivo—————

Which Mr. Dryden thus Englishes:

lofty Neck'd,
 Short beaded, Barrel belly'd, broadly back'd;
 Brawny his Chest, and deep, his Colour Gray,
 For Beauty dappl'd, or the brightest Bay;
 Faint White, and Dun, will scarce the rearing pay. }

To these Perfections of Shape we find added, his proud Gate, and his bold and daring Courage; these Qualifications are requisite for a Stallion; but we are forewarn'd against breeding from him when he grows Old, but while he is in Strength, and even then we must give him high feeding before we bring him to the Mare; for if the Sire be not in full Vigour, they teach us, the Offspring will be weak; which is certainly a Maxim very well worth our Notice. But on the other Hand we are directed, when the Mares begin to grow Horsey to keep them low, debarring them from Excess of Food, and suffering them to drink little, and seldom; and to tame their Wantonness, we are also directed to keep them low by hard Labour. This *Virgil* tells us, and supports by the following Argument.

*Hoc faciunt, nimio ne luxu Obtusior usus
 Sit genitali arvo, & sulcos oblimet inertes:
 Sed rapiat sitiens Venerem, interiusque recondat.*

This Mr. Ogleby Translates:

*These Arts are used, lest that the Field of Love
 By too much wanton Rankness Barren prove.*

And Mr. Dryden goes on:

*And the fat Furrows should the Juice destroy
 Of genial Lust, and dull the Seat of Joy, &c. **

We find in every Branch of Nature, that too much Vigour of Growth in the Females, is an Enemy to Generation ; and so in this Case, as well as the rest, it may be so : But 'tis an Argument which allows of Contradiction, and I shall therefore leave it to follow the plain Instructions of the Ancients, who teach us, that when the Mares are with Foal, we must avoid putting them to any hard Labour, or suffer any violent Exercise, and particularly we are warn'd to keep our teeming Cattle from the Gad Fly, or *Afilus*, according to the *Latins*, because this Insect, by stinging of them, will give them too violent a Motion.

But when the Foal is once brought forth, we ought then to consider the Use he is design'd for, that in his younger Days he may be led gently to his Business.

The Heifers which we chuse for Breeding, *Virgil* describes,

————— *optima torvæ*
Forma bovis, cui turpe Caput, cui plurima Cervix
Et Cum unctenus amento paleavia pendent.
Tum longo nullus lateri modus : omnia magna :
Pes etiam & caminis hinc & sub cornibus aures,

Which *Mr. Dryden* gives us in English as follows :

The Mother Cow must wear a lowering look,
Sour headed, strongly neck'd to bear the Yoke.
Her double dew Lap from her Chin descends,
And at her Thighs the ponderous Burden ends :
Long are her Sides, and Large, her Limbs are great,
Rough are her Ears, &c.

These are the common Beauties of a Cow, described by *Virgil* : But he goes on to recommend those

those which are deck'd with white Spots, and are apt to offer their Horns, which last indeed is a Sign of Vigour, but carries so much Danger with it as not to be coveted in a Farm. But it is observable, such Cows bring the largest and strongest Calves.

We are in the next Place told, that we ought not to bring them to the Bull 'till they are four Years old, nor suffer them to breed after they are ten Years old, for then they are past their Strength. We find here a noble Design for breeding of Creatures that should have full Perfection, that no base Breed should trouble the World, which must necessarily happen when either the Dam is too Young, or too Old. *Varro*, *Columella* and *Pliny*, all join with *Virgil*, in his Description of a beautiful Heifer to breed from; and likewise, that she should be visaged like the Bull. For the Particulars relating to the Food for this Sort of Cattle, we shall find it set down in the Chapter of Fodder. I could add the Method of feeding Cows in *England*, and of the Profit they bring to the Husbandman. But I have already treated at large upon that Subject, in my Monthly Writings.

I find the Ancients, in the next Place, preferr'd the Goat, as an Animal which was of great Profit to them; the Sort which they chiefly recommend is the *Cinyphian* Goat, from *Libya*, which had a brisley Hair, which I find they cut to a good Advantage, and undoubtedly knew the Use of their Skin, though they tell us nothing of it; they yield abundance of Milk, which is extremely rich, and adds an extraordinary Fatness to whatever Milk it is mix'd with; and the Flesh of them, if it is Young, is no way to be disliked, but especially it is to be admired in young Kids: I have much wonder'd they are not more general in *England*, in some
A a 4 of

of our most barren Grounds, for they will even feed where there is not Food for Sheep. The Ancients tell us, that we must shelter them in Winter, and that the *Arbutus*, or Strawberry Tree is then a good Browse for them. During this Housing them is the proper Time to save their Dung, which may be best done by spreading Beds of Sand in the Houses where we keep them, and taking that and the Dung together to lay in Heaps, for the Improvement of Land. The Hair of Goats is of excellent use to make Ropes with, as the Ancients tell us, enduring a long Time in Water without Rotting. These take a particular delight in browsing upon Trees, chusing such kind of Food rather than Grass; therefore we must take great Care to keep them from our young Plantations. These commonly breed twice in a Year, bringing sometimes two, but generally three Kids at a Time.

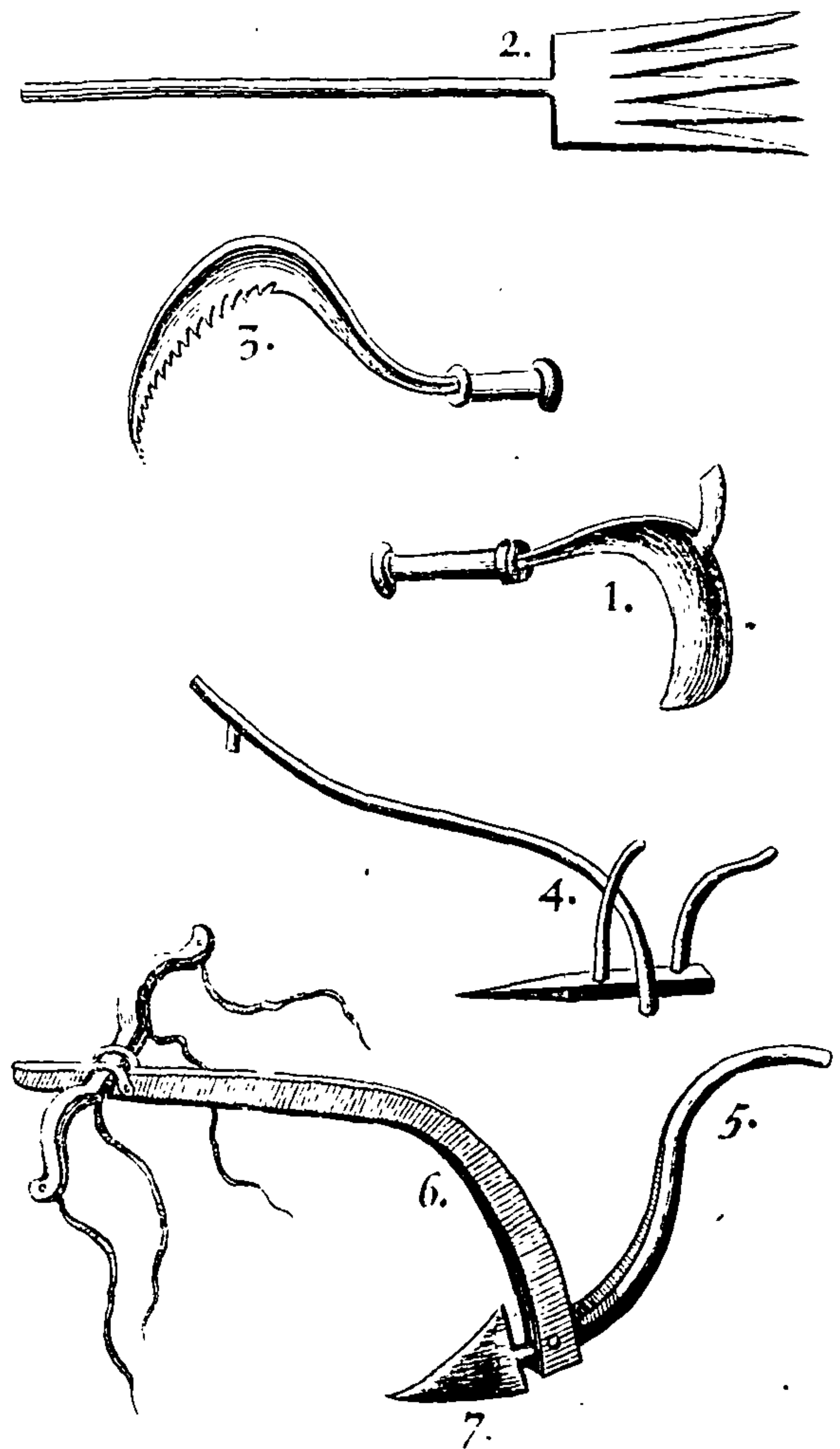
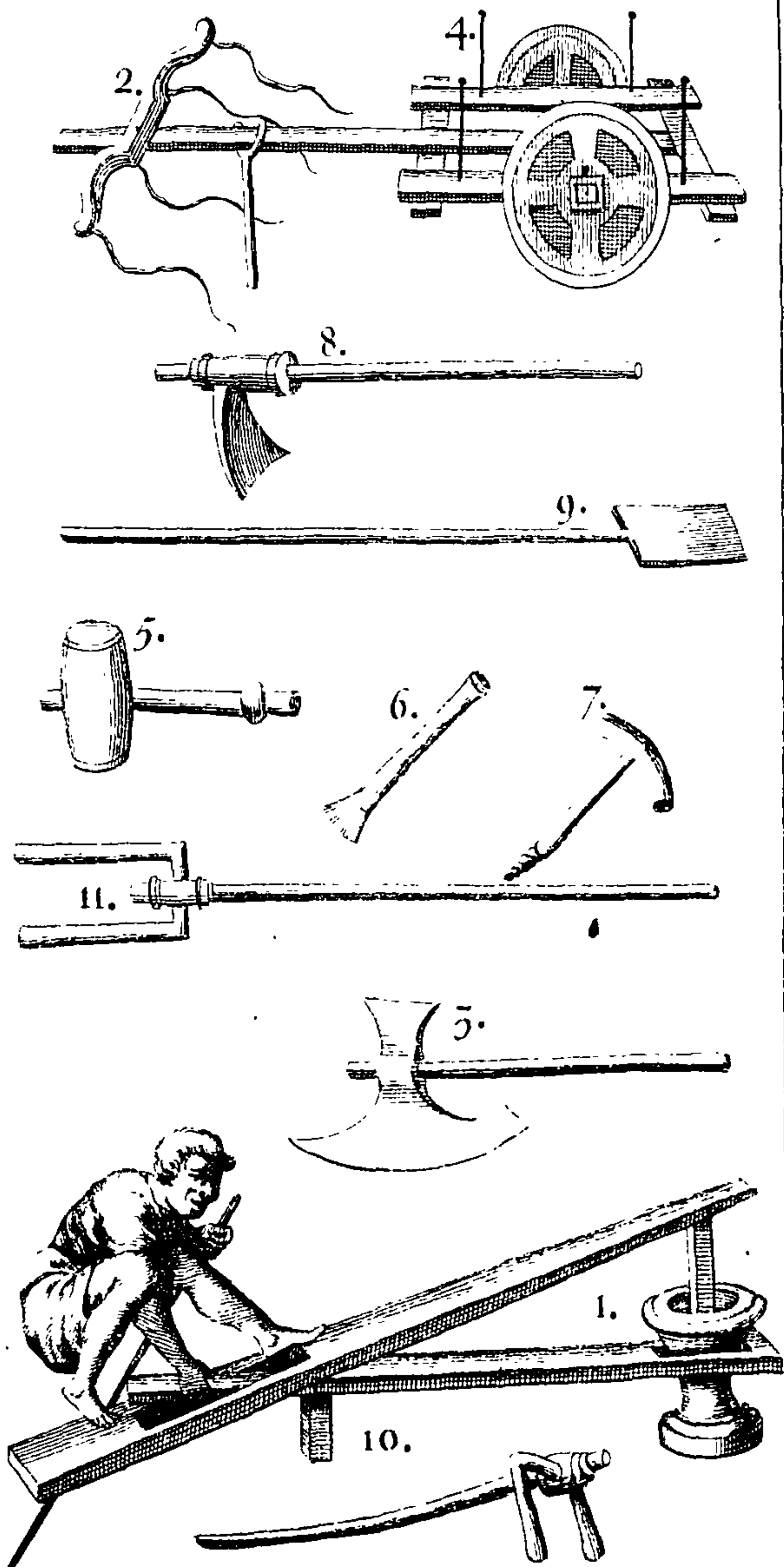
Columella tells us, that the Sheep of *Miletus* were in great Esteem for their Wooll; and indeed, considering the great Profit which is made of the finest Sort, a Farmer cannot be too careful in the Choice of such Sheep as are of the finest Staple; for in a Flock of five Hundred Sheep, he will find many Pounds difference in the Profit of his Sheep, only on that Account; and I think, since a Sheep of a coarse Staple, will eat as much as one that has finer Wooll, one would rather chuse the best if one was to pay dearer for them. Their Sorts I have treated of at large in my Monthly Works, as well as the breeding and educating of Lambs all the Year round. But it is necessary I observe, that special Care should be had, that our Sheep should be sound when we buy them into the Farm; such as are seiz'd with the Rot may be known by having their Gums White, their Eyes Pale, and their Teeth Yellow and Fowl. If they prove Sound, we should not covet to have them take

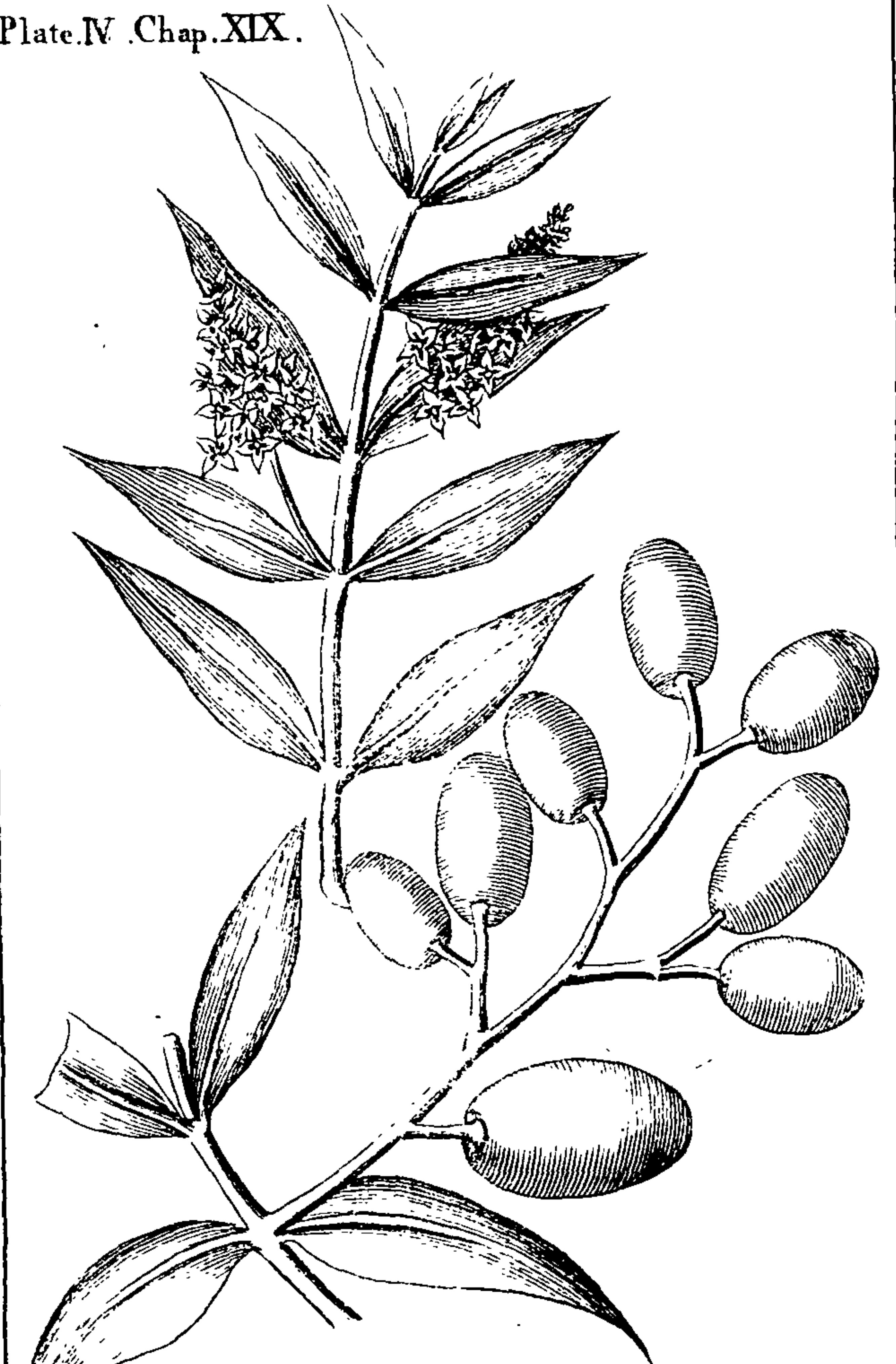
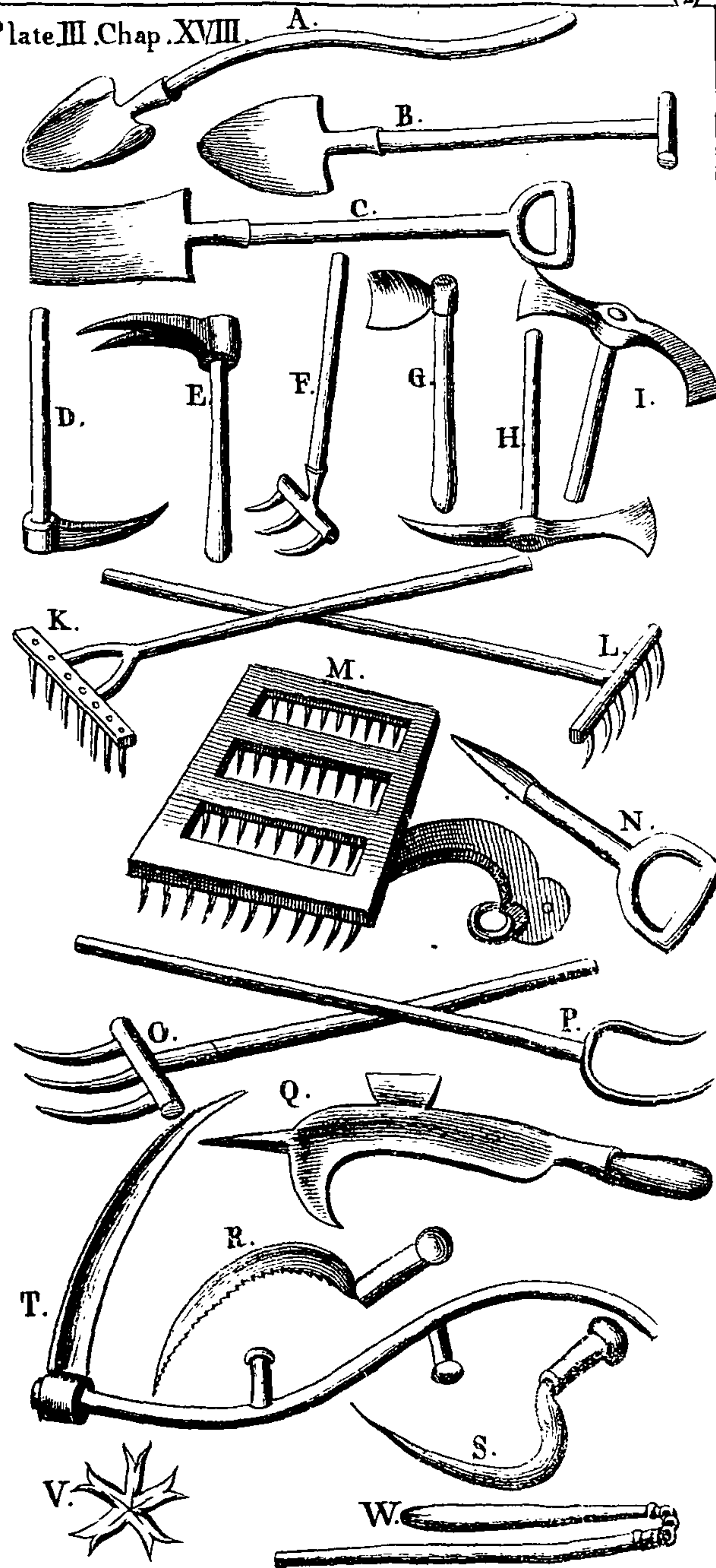
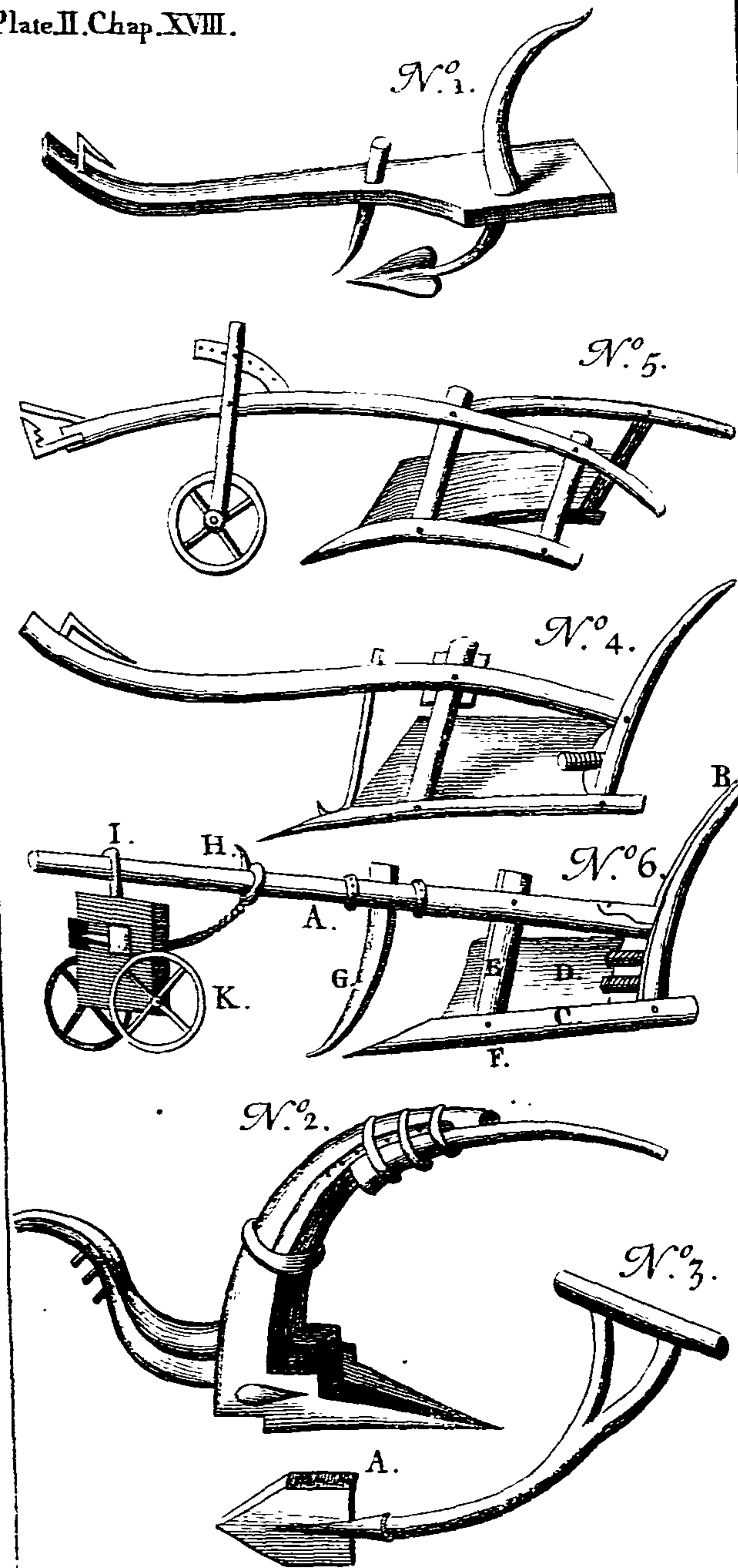
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the Ram 'till they are two Years old, for sooner than that would weaken them too much. We may allow them to breed 'till seven Years old, and not longer, for after that their Limbs will be Weak. We may know their Age by the Number of their Fore-Teeth, a Sheep of one Shear will have two broad Teeth before; one of two Shear will have four; one of three, six; and one of four eight. When we would bring the Ewes to the Ram, we should carefully consider what green Fodder we shall have at the Time the Lambs will be brought forth, for then neither the Sheep nor the Lambs must want a good Plenty of Food, lest the Lambs should be stunted; but if you know when your Grass, or your Turneps, will come in, you may easily calculate when to let the Ewes take the Ram, for a Ewe goes just twenty Weeks. About *Michaelmas* the Males should be separated from the Females, and such as we like best for Rams we should then pitch upon, and geld the rest, for this Operation should always be done when the Sheep are very young.

I come now to conclude this Work, wherein I have endeavour'd to give my Reader the true Sense of the ancient Writers of Husbandry; and I have so contrived my Remarks upon them, that it will be easy for those of the meanest Capacity to make the Trial of any Experiment they recommend.

F I N I S.





The Luca Olive.

The sorts of Olives mention'd by Columella, are.

- N.º 1. Paulia.
- 2 Algiana.
- 3 Liciniana.
- 4 Sergia.
- 5 Nevia.

- N.º 6. Culminea.
- 7. Orchis.
- 8. Regia.
- 9. Circites.
- 10. Myrtea.

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N. B. The Reader is desir'd to correct the few Errors of the Press, which were occasion'd by the Author's being sometimes in the Country while the Work was Printing.

F I N I S.